Apple-Works Forum

Special Issue

The Monthly Publication of NAUG - The National AppleWorks Us

AppleWorks 3.0

What's new in version 3.0?

Page 3

How to upgrade to AppleWorks 3.0.

Page 7

Which enhancements work with AppleWorks 3.0?

Page 11

An AppleWorks 3.0 author writes about its undocumented features

Page 14

Special upgrade offer for NAUG members.

Page 7

A history of Apple-Works 3.0.

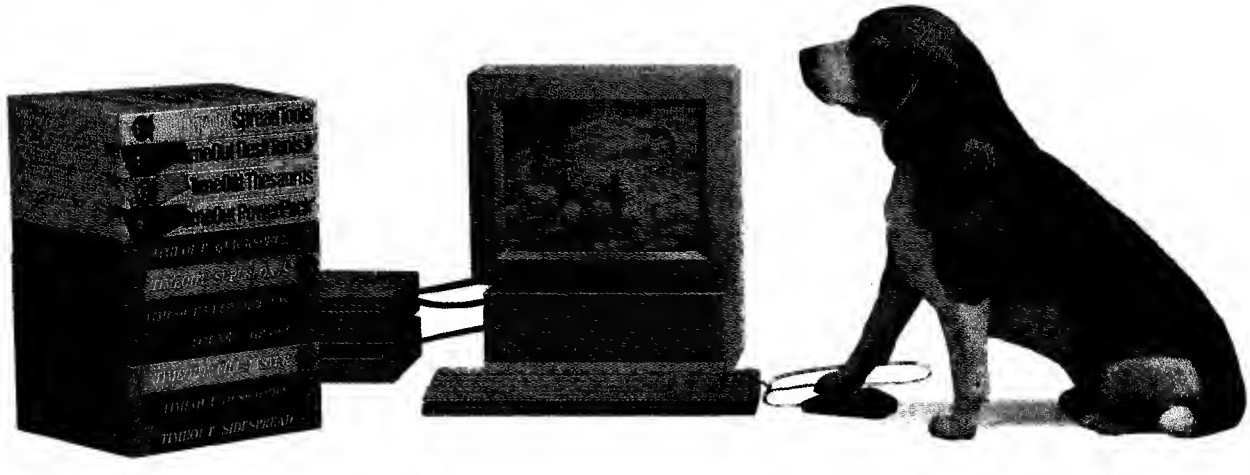
Page 5

NAUG
National AppleWorks Users Group
Box 87453, Canton, Michigan 48187
(313) 454-1115
BBS (313) 482-8090

SECOND CLASS
Postage Paid at Plymouth, MI and other offices

TIME VALUE MATERIAL

UNLEASH THE POWER.™



Every step toward increasing productivity is vital in keeping up with today's market. That is why we created the fastest and most powerful AppleWorks enhancements ever.

The TimeOut series.

Programs so powerful and efficient you never have to leave AppleWorks. Programs to check your spelling, produce Macintosh quality fonts, increase your spreadsheet capacity, triple your desktop, even graph your spreadsheet data with nine different graph types, and much, much more!

But don't let this overwhelm you.

As powerful and swift as TimeOut enhancements are, underneath they are easy to use and backed by friendly and loyal people. We stand behind every product we sell with a money-back guarantee and a team of customer service and technical support personnel to answer any questions you may have.

To request our catalog or for more information call 619-452-5500, Fax# 619-452-6374. Look for our products at your local dealer.

BEAGLE BROS SOFTWARE EST. 1980

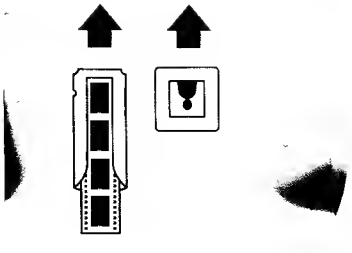
©1989, Beagle Bros, Inc., 6215 Ferris Square, Suite 100, San Diego, CA 92121 • TimeOut requires an Apple IIgs, IIc or IIe (128K min) and AppleWorks v2.0 or 2.1 • Network/District/Site licenses available
To request our catalog or for more information call 619-452-5500 • To order call 800-345-1750, in California call 800-992-4022 • AppleWorks is a registered trademark of Apple Computer, Inc., licensed to Claris Corp.

Your *NAUG membership* makes you eligible for a special AppleWorks 3.0 Upgrade Offer from Claris Corporation...

LATE NEWS:
AppleWorks 3.0 is scheduled to ship mid-to-late August 1989. You may send in your order now, and Claris will process and ship it as soon as the product is available.

For *NAUG members* who can find their original AppleWorks disk:

Send Claris your original* AppleWorks disk, and you can upgrade to AppleWorks 3.0 for only $79. You get new documentation and all the benefits of registration, including free technical support and future upgrade offers.



* If you already registered your copy of AppleWorks with Claris, you are eligible for a separate offer and will receive an upgrade mailing directly from Claris.

AppleWorks 3.0 Upgrade Coupon

1. Your name and address

(Must match your *NAUG* label. To expedite your order, please print legibly)

Last Name *First Name*

Company

Address

City, State, Zip

Telephone

2. Select media size

☐ 3.5" disks ☐ 5.25" disks

3. Choose your upgrade option

☐ Enclosed is my original AppleWorks disk and payment. Please enter $82.00 ($79.00 plus $3 for shipping) here $ _____

☐ I do not have my original AppleWorks disk. Please enter $102.00 ($99.00 plus $3 for shipping) here $ _____

Add applicable sales tax based on ship location $ _____

Total amount enclosed $ _____

4. Enclose payment (P.O. s not accepted)

☐ Check ☐ Visa ☐ MasterCard

Card Number

Expires *Signature*

5. Mail this form to:

AppleWorks 3.0 Upgrade
Alexander & Lord Distribution Center
P.O. Box Claris
Carmel Valley, CA 93924-9978

If you have any questions about the program, call ***1-800-628-2100****. Items are shipped UPS ground; please allow 3-4 weeks for delivery.*

NOTE: This offer is only valid for *NAUG (National AppleWorks Users Group)* members, and is not transferable. This coupon may not be duplicated, and must accompany your upgrade request.

More Than 100 New Features

■

AppleWorks 3.0 software incorporates the most frequently requested AppleWorks enhancements. And it still runs on a modest 128K... ***very fast!*** Here are some of the new features awaiting you:

General Enhancements

Copy between all modules • Expanded clipboard size • Enhanced printer support • Easy management of pathnames • Accommodates larger files • Enhanced import/export functions • Auxiliary memory card support

Word Processor

Spell checking • Left, right, center and decimal tabs • Right justification • Multiline headers and footers • Enhanced printer options

Data Base

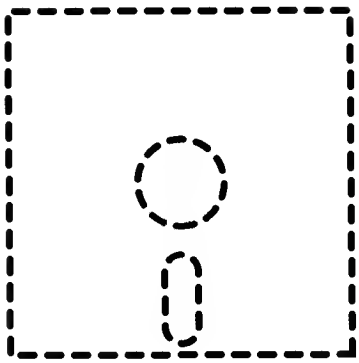
Horizontal scrolling • Multiple levels of sorting • 3-across labels • Enhanced Find command • Left side titles • Improved record layouts and report formats

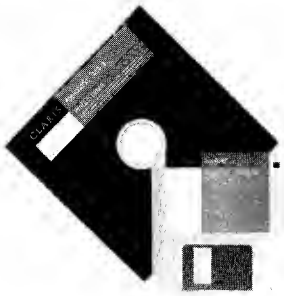
Spreadsheet

26 new functions • Improved label/value handling • Copy/move blocks

Hardware Requirements
Apple IIc, IIc Plus, IIe (minimum 128K), IIGS.

For those who cannot:





For a limited time, you can upgrade to AppleWorks 3.0 for just $99. Send Claris your payment and the AppleWorks 3.0 Upgrade Coupon at the right. You will get a complete set of manuals and diskettes, and all the benefits of being a registered AppleWorks user.

Take advantage of this special AppleWorks 3.0 upgrade offer for *NAUG members*. You will receive the latest version of AppleWorks and complete documentation. Please be sure to send in your registration card to become a Claris Registered User, and be eligible for free technical support and future upgrades.

Both upgrade offers represent significant savings over AppleWorks 3.0's regular retail price of $249.

This offer expires September 30, 1989.

This offer extended to December 31, 1989.

Order Now...
and receive a coupon to purchase TimeOut UltraMacros from Beagle Bros for only
$29.95!
(Standard retail price is $59.95)
Automate your AppleWorks today!

CLARIS

If you have technical questions, please call
Claris Technical Support at (408) 727-9054.

© 1989 Claris Corporation. All Rights Reserved. Claris is a trademark of Claris Corporation. AppleWorks is a registered trademark of Apple Computer, Inc., licensed to Claris Corporation. Apple is a registered trademark of Apple Computer, Inc. Beagle Bros is a registered trademark of Beagle Bros, Inc. UltraMacros is a trademark of Beagle Bros, Inc.

capacity, triple your desktop, even graph your spreadsheet data with nine different graph types, and much, much more!

But don't let this overwhelm you.

As powerful and swift as TimeOut enhancements are, underneath they are easy to use and backed by friendly and loyal

©1989, Beagle Bros, Inc., 6215 Ferris Square, Suite 100, San Diego, CA 92121 • TimeOut requires an Apple IIgs, IIc or IIe (128K min) and AppleWorks v2.0 or 2.1 • Network/District/Site licenses available
To request our catalog or for more information call 619-452-5500 • To order call 800-345-1750, in California call 800-992-4022 • AppleWorks is a registered trademark of Apple Computer, Inc., licensed to Claris Corp.

AppleWorks Forum

The Monthly Publication of **NAUG:** ***The National AppleWorks Users Group***

Volume IV, No. 7 **Four Dollars**

TABLE OF CONTENTS

Support for AppleWorks and ///EZ Pieces Users

Claris Releases AppleWorks 3.0

On June 20, after a year of intensive, often secretive work, Claris Corporation announced the release of AppleWorks 3.0, the first major upgrade to AppleWorks since its introduction in 1983. The release of AppleWorks 3.0 is important news to the AppleWorks community, but there is greater significance than just the release of the program. The joint development of this version of AppleWorks by Claris and Beagle Bros demonstrates unusual cooperation between the two major players in the Apple II software market. Both companies continue to invest significant resources in the Apple II market. Finally, Claris repeatedly demonstrated their interest in the needs of AppleWorks users by working closely with the officers at **NAUG**.

We dedicate much of this issue of the ***AppleWorks Forum*** to helping members learn about AppleWorks 3.0. Our lead article outlines the new features in the program. Another article describes the status of AppleWorks enhancement products for version 3.0. A third article presents some insights into the program by Randy Brandt, one of the three Beagle developers who wrote the program. Other sidebars describe the history of the product and how to upgrade to AppleWorks 3.0. Bound into the center of this issue is a special offer from Claris to **NAUG** members who do not have an original AppleWorks program disk.

The ***National AppleWorks Users Group*** (NAUG) is an association that supports AppleWorks users. **NAUG** provides technical support and information about AppleWorks and enhancements to that program. Our primary means of communicating with members is through the monthly newsletter entitled the ***AppleWorks Forum***.

We want to thank the many people who provided the necessary information and who read the galleys of the articles about AppleWorks 3.0: Elisa Nakata (AppleWorks Product Manager), John Kinder (AppleWorks Project Manager), Randy Brandt, Rob Renstrom, and Alan Bird (the programmers who wrote AppleWorks 3.0), and Jon Simonsen (Vice-President at Beagle).

Thanks also to the many **NAUG** members who told us what they wanted in the new version of AppleWorks and to the members who served as beta testers of the new product.

Our extended coverage of AppleWorks 3.0 in this issue took space that we usually devote to letters and useful articles from members. We will resume our normal balance of content in next month's issue of the ***AppleWorks Forum***.

AppleWorks Forum

Editor: Cathleen Merritt
Associate Editor: Warren Williams
Technical Coordinator: James Smith
Page Layout: Nanette Luoma
Publisher: The National AppleWorks Users Group

©COPYRIGHT 1989, by NAUG, The National AppleWorks Users Group, for the exclusive use and enjoyment of its members. Any reprint or reproduction must be approved in writing and in advance by NAUG.

The "AppleWorks Forum" (ISSN 0893-4118) is published monthly for $27 per year by the National AppleWorks Users Group, 49068 Harvest Dr., Plymouth, MI 48170.
Second Class postage paid at Plymouth, MI, and additional mailing offices.
POSTMASTER: Send address changes to AppleWorks Forum, NAUG, Box 87453, Canton, MI 48187

AppleWorks 3.0: A Major Upgrade

by Warren Williams

Claris Corporation just released AppleWorks 3.0, the most significant upgrade of AppleWorks since its introduction in 1983. AppleWorks 3.0 includes many of the features users want added to the program, including major enhancements to all three AppleWorks modules. The AppleWorks 3.0 word processor offers built-in spell checking, true tabs, enhanced control over formatting, multi-line headers and footers, and an improved screen display. The date base adds horizontal scrolling in multiple record layout, automatic printing of two-up and three-up labels, and the capability to remember up to 20 report formats. The spreadsheet offers 26 additional mathematical and logical functions, the ability to handle string logic, and the capability to copy and move blocks of cells. Power users will appreciate the program's enhanced ability to easily transfer data between AppleWorks modules and to other word processor, data base, and spreadsheet programs.

"The most significant upgrade of AppleWorks since its introduction."

In this article, I will describe the features of AppleWorks 3.0 based on my experience with the program since Claris made the first pre-alpha version available to NAUG in October, 1988.

Word Processor

Spell Checking: The AppleWorks 3.0 word processor includes an enhanced version of TimeOut QuickSpell, the popular spell checking program developed by Alan Bird. You invoke the spell checker by issuing an Apple-V command (to "Verify Spelling"); AppleWorks checks the complete document, any word, or any block of text you specify. You can check documents against a custom dictionary, including custom dictionaries developed with QuickSpell. The spell checker lets you specify if you want to view the words in a list or in the context of the document. As with QuickSpell, the spelling module offers suggested spellings and lets you add words to a custom dictionary as you work.

The AppleWorks 3.0 spell checker has a more sophisticated spelling algorithm than QuickSpell; AppleWorks recognizes phonetic spellings while QuickSpell only reads the letters in a word. For example, AppleWorks 3.0 recognizes "sikology" as "psychology" and suggests the correct spelling. QuickSpell is confused by the phonetic spelling.

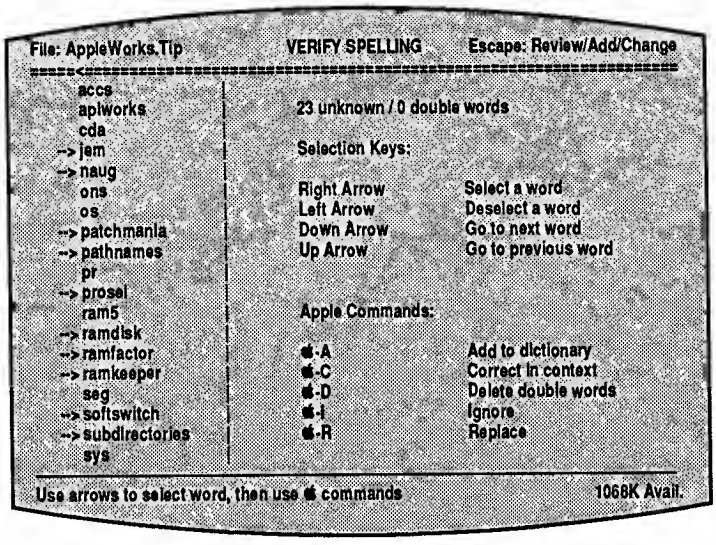
Like QuickSpell, the AppleWorks spell checker also displays a summary of information about a document, including the number of words in the file; this is useful for writers and students who must prepare manuscripts and papers of specified length.

Figure 1 presents an example of the AppleWorks 3.0 spell checker screen.

Right Justification: AppleWorks 3.0 adds a Right Justify Command to the Options Menu. Issue an RJ command, and all following lines are right justified until you issue an Unjustify, Justify, or Center Command.

Easier Command Entry: The program lets you use the Control Key to issue many word processor formatting commands. While earlier versions of AppleWorks let you use Control-L to invoke underlining and Control-B to command boldface, AppleWorks 3.0 lets you use Control-C to issue a Center Command, Control-P to insert a New Page Command, Control-N to set "normal" justification (it

Figure 1: AppleWorks 3.0 Spell Checker



issues an Unjustify Command), Control-F to set "full" justification (it issues a Justify Command), and Control-R to issue a Right Justify Command.

Enhanced Printer Control: AppleWorks 3.0 lets you print any specified range of pages in a document; earlier versions of AppleWorks make it difficult to define where printing should stop.

AppleWorks 3.0 offers Print Date (PD) and Print Time (PT) commands which automatically print the current date or time anywhere in a document. Insert a Print Date Command in a letter you store on disk, and AppleWorks will insert the current date when you print the letter.

AppleWorks 3.0 lets you send up to six different custom printer codes from within a document. For example, if your printer offers italics, you can enter custom codes for italics begin and italics end into AppleWorks' printer codes area. You can call those codes at any point within a word processor file to get italic output. You no longer have to define your printer as a custom printer to use its features not supported by AppleWorks.

AppleWorks 3.0 lets you underline entire documents or print complete documents in boldface. Earlier versions of AppleWorks turn off the underline and boldface commands at the end of the first paragraph.

Multi-line Headers and Footers: AppleWorks 3.0 overcomes AppleWorks' one-line limitation on headers and footers; 3.0 lets you enter a header or footer of any length. You enter a Header Command (HE) and then indicate the number of lines in the header. The Footer Command (FO) works the same way to let you generate multi-line footers.

Enhanced Tabs System: AppleWorks 3.0 offers true tabs, thus overcoming a serious limitation in earlier versions of the program. With AppleWorks 3.0 you can specify left justified tabs, right justified tabs, decimal tabs, and centered tabs. You can specify different tab settings for each paragraph in a document.

Improved Screen Display: Earlier versions of AppleWorks display some commands (such as Footer, Header, and caret marks) when you "zoom out" to look at the document without the format settings. AppleWorks 3.0 hides all format options and caret marks when you "zoom out"; the program gives you a better idea of your final printed output. Of course, all the commands appear when you "zoom in" to look at the format settings.

Enhanced Cursor Control: The program makes it easier to navigate around a word processor document by offering the Apple-. and Apple-, commands that jump to the beginning and end of the current line.

Allows Longer Documents: AppleWorks 3.0 overcomes the document length limitation in earlier versions of the program. If you have sufficient memory, AppleWorks can accommodate documents up to 16,250 lines long (about 615 double-spaced pages). Earlier versions of AppleWorks limit you to approximately 1160 lines on an Apple IIe or IIc and 6000 lines on a IIGS.

Figure 2 lists the limits and capacities of AppleWorks 3.0.

Data Base Enhancements

Horizontal Scroll: AppleWorks 3.0 overcomes an annoying limitation of earlier versions of AppleWorks; the inability to see complete records in multiple record layout. With version 3.0 you can press the Tab Key to scroll to the right in multiple record layout; Apple-Tab scrolls to the left. The Apple-Arrow Keys scroll full pages left or right. In addition, AppleWorks 3.0 lets you lock some categories at the

The Making of AppleWorks 3.0

In late 1987, Claris Corporation decided on a two-step approach to upgrading AppleWorks. First, the company wanted to show its commitment to AppleWorks and develop a line of communication with AppleWorks owners. They contracted with Robert Lissner, the original author of AppleWorks, to release an update to the program. Lissner fixed the known bugs in version 2.0, updated the program so it was compatible with the enhanced storage capacity of the Apple IIGS, and improved the performance of the spreadsheet module. Claris released AppleWorks 2.1 in August 1988 and distributed copies free to owners of AppleWorks 2.0.

At the same time, the company realized that the product, originally developed to run on 1983-generation hardware, was ready for major enhancements. Elisa Nakata, AppleWorks Product Manager and John Kinder, AppleWorks Project Manager, initiated and took responsibility for the project. They talked with users and industry leaders, distributed questionnaires, and reviewed **NAUG**'s "AppleWorks Wish List". In October 1988, they released the preliminary specifications for "Spike", the code name assigned to AppleWorks 3.0. The goal was to announce the product in late spring or early summer of 1989.

Who Would Write the Program?

Claris decided that the TimeOut development team at Beagle Bros was best suited to write the new program and the two companies signed a contract during the summer of 1988. Alan Bird would write the spell checker and enhance the word processor, Randy Brandt would upgrade the data base, and Rob Renstrom would revise the spreadsheet. In addition, Bird would enhance the program's memory manager, Brandt would upgrade the desktop interface and implement new user interface features, and Renstrom would enhance the printer support available in the new version of AppleWorks.

Claris and Beagle continued to develop specifications for the product as work progressed on Spike. They "froze" the design in January 1989 and Beagle completed the code for the first beta version by late February. In early March, Claris distributed beta versions of Spike to testers, and turned their attention to fine tuning the program.

Original plans called for introducing Spike as AppleWorks 3.0 at the Boston AppleFest show in early May, with shipments planned for mid-June. However, the company extended the beta tests to insure the robustness of the product, and changed the shipping date to late that month. As a result, Claris gave previews of Spike to the press at Boston AppleFest, but delayed the 3.0 announcement until June 20, the first day of the National Educational Computer Conference.

— Cathleen Merritt

left edge of the multiple record layout screen; much as you can use titles in the spreadsheet module. This lets you keep some data on the screen while you scroll horizontally to display additional categories.

Enhanced Arrange Command: AppleWorks 3.0 supports multiple levels of sorting with a single Apple-A command. You can now tell AppleWorks to sort a file by up to three categories in a single pass. With earlier versions of AppleWorks you had to specify each category in a separate Arrange Command.

Easier Report and Screen Formatting: AppleWorks 3.0 makes it easier to develop report and screen formats by linking the tables format report and multiple record layout screen displays. Specifically, the program lets you automatically convert the current multiple record display into a tables format report, or let you use a tables format report to define the multiple record layout for the file.

Enhanced Find Command: The new version of AppleWorks lets you limit the Find Command so it searches only a single category. This enhances the power and speed of this command.

Enhanced Label Reports: AppleWorks 3.0 lets you print label format reports on two-up and three-up labels. In fact, the program lets you print labels format output in up to 24 columns; creative users

will find many applications for this multiple-column output. Earlier versions of the program supported only one-up labels.

Larger Files: If you have sufficient memory, AppleWorks 3.0 will handle files with up to 16,250 records. In addition, the program now manages up to 20 report formats in each data base file. Earlier versions of AppleWorks were limited to either 1,100 or 6,000 records (depending on whether you were running on an Apple IIe/IIc or Apple IIGS) and eight report formats.

Other Data Base Enhancements: Apple-. moves the cursor to the last category in the current record; Apple-, moves the cursor to the first category in the record. Enter an "@" in a "date" category, and AppleWorks 3.0 inserts the current date in the record. If you have an Apple IIGS or an ProDOS-compatible clock in your Apple IIe or IIc, the program enters the correct time in a "time" category when you type the symbol "@".

Spreadsheet Enhancements

Enhanced Copy/Move Commands: AppleWorks 3.0 lets you use the clipboard to copy or move blocks or columns of cells between spreadsheets. (Earlier versions of AppleWorks only let you move complete rows to the clipboard.) There are numerous applications for this feature; for example, it is now easier to transfer cells containing monthly totals from one spreadsheet into an annual summary worksheet.

When you copy groups of formulas, you no longer have to respond to each "No Change" or "Relative" prompt. Enter an Apple-N if all responses are "No Change" or an

Figure 2: Limits and Capacities

General

Maximum number of printers	3
Maximum number of files on the desktop	12
Maximum number of files on a disk	50 in root directory, 170 in each subdirectory
Desktop size	40K for a 128K Apple IIe or IIc 76K for a 256K Apple IIGS
Clipboard size	Limited only by available memory

Word Processor

Maximum document size	16,250 lines, about 300 pages (deduct 1 line for each page, including forced page breaks)
Practical document size	128K Apple IIe or IIc: 680 lines (12 pages) 256K: 2048 lines (37 pages)
Number of tab rulers in a document	Limited by memory
Number of words in dictionary	Approximately 90,000*
Maximum words in Custom Dictionary	Limited by disk space
Maximum page length	14 inches
Maximum page width (platen width)	13.2 inches*

Data Base

Maximum characters per category	78*
Maximum characters per record	2048
Maximum categories per record	30
Maximum records in data base	16,250
Practical number of records in data base	128K: >400 with 100 characters per record, >100 with 400 characters per record 256K: >1800 with 100 characters per record, >450 with 400 characters per record
Maximum number of reports/formats	20
Number of arranging categories	Up to 3 at a time
Maximum number of calculated categories	3
Maximum number of categories in report	33 (30 categories + 3 calculated categories)
Maximum number of grouped subtotals	3

Spreadsheet

Accuracy	14 places
Number of rows	9999 rows
Number of columns	127 columns
Total empty cells	1,269,873 cells
Largest practical worksheet	128K: 3000 cells 256 K/IIGS: 10,000 cells 256K/IIe: 15,000 cells
Maximum column width	70 characters
Minimum column width	1 character
Maximum number of characters per cell	70 characters (depends on column width)
Maximum size of formula in one cell	78 characters*
Maximum number of characters per row	10,240 characters*

*This value differs from the number given in the AppleWorks 3.0 documentation. We tested the program and believe our number is correct.

How to Upgrade to AppleWorks 3.0

AppleWorks 3.0 has a list price of $249, and will be available from dealers by July 1. Claris will offer discounts to help users upgrade to version 3.0. The upgrade package includes complete documentation and either 3.5-inch or 5.25-inch disk copies of the program.

How to proceed depends on whether or not you are registered with Claris.

Claris Registered Users: Registered AppleWorks owners will receive a letter from Claris offering them an upgrade for $79. They will not have to return their original AppleWorks disks.

You will get this letter (a) if you purchased AppleWorks 2.0 or 2.1 in a Claris box and returned the registration card, or (b) if you upgraded to AppleWorks 2.1 from an earlier version of the program.

Claris Registered Users should wait for this letter; it is the most convenient way to upgrade to version 3.0.

Non-Registered Users: If you are not a Claris Registered User, you can still upgrade to 3.0.

If you can find your *original* AppleWorks disks, you must return those disks along with payment of $79 plus shipping and the form enclosed in this issue of the ***AppleWorks Forum***. You can return any U.S.A. version of AppleWorks to qualify for the $79 upgrade price.

NAUG members who cannot produce original AppleWorks disks can participate in a special **NAUG**/Claris upgrade program. Complete the upgrade form enclosed in the center of this issue of the ***AppleWorks Forum*** and remit payment of $99, plus shipping. Note that you must send Claris an *original* form; Claris will not accept photocopies.

"Apple-R" to signal that all answers are "Relative".

Enhanced Printing: The program automatically segments the printing of large spreadsheets into manageable units. If you print a spreadsheet that will not fit on a single page, AppleWorks 3.0 prints the columns that fit on one page, then prints the next series of columns on a separate page.

Additional Spreadsheet Functions: AppleWorks 3.0 adds 26 spreadsheet functions, including five arithmetic, nine trigonometric, six financial, and six logical functions. *Figure 3* lists these functions.

Allows String Logic: AppleWorks 3.0 supports string logic. For example, you can now display the word "Excellent" in a cell if another cell contains a particular number. The program's @LOOKUP, @CHOOSE, @IF, @AND, @OR, and @NOT functions all handle text strings.

Larger Spreadsheet: If you have sufficient memory, the AppleWorks 3.0 spreadsheet offers 9,999 rows instead of the 999 rows in earlier editions of the program.

Improved Cursor Movement: Apple-. moves the cursor to the last non-blank column in a spreadsheet; Apple-, moves the cursor to Column A.

Additional Features

Memory Management: AppleWorks 3.0 automatically recognizes peripheral slot memory cards (e.g., Apple expanded memory and RamFactor cards) and auxiliary slot memory cards (e.g., RamWorks, Z-Ram, and Checkmate cards). Earlier versions of AppleWorks required a patch to recognize auxiliary slot cards.

If you have sufficient memory, you can configure AppleWorks 3.0 to pre-load any or all the modules into RAM; this speeds up program operation and eliminates the need for disk access. In addition, the printer drivers now load onto memory expansion cards; AppleWorks 3.0 no longer accesses the Program Disk when you issue an Apple-P command.

Printer Support: AppleWorks 3.0 supports 22 printers not supported by earlier versions of the program. (*Figure 4* lists the printers on the AppleWorks 3.0 Printer Menu.) Of course, AppleWorks 3.0 supports all printers that emulate any printer on this list. For example, the program supports all Epson-compatible printers. Finally, AppleWorks 3.0 will control up to three custom printers; AppleWorks 2.1 and earlier only accommodate a single custom printer.

As mentioned earlier, you can add up to six user-definable printer codes in the word processor module, so you do not have to define a printer as a custom printer to access the codes for different fonts, graphics, or foreign language output.

Management of Subdirectories and Pathnames: AppleWorks 3.0 makes it easier to use subdirectories and pathnames. Indicate you want to change the location of a data disk, and AppleWorks offers a list of all available disk drives, plus the choice "ProDOS Directory". Select "ProDOS Directory" and AppleWorks 3.0 presents a list of the subdirectories on the current disk. You can select any subdirectory from the list as you would select a disk or file. AppleWorks 3.0 also offers a series of keystroke commands that let you move between levels of subdirectories. The program also offers a "SmartSave" feature. Enter a Control-Open Apple-S command, and AppleWorks 3.0 saves a file back to its original subdirectory, even if you change the active data disk.

Enhanced Clipboard: AppleWorks 3.0 incorporates three major enhancements to the AppleWorks clipboard. First, the program eliminates the limitation on clipboard size; AppleWorks 3.0 lets you use all available memory for the clipboard. Second, the program lets you use the clipboard to transfer information directly between all three modules. You can now transfer data between data base and spreadsheet or from word processor to spreadsheet files without dealing with ASCII or DIF files. Finally, the program lets you copy and/or move blocks of cells between spreadsheet files.

Enhanced Text Import/Export: AppleWorks 3.0 handles tabs correctly when importing and exporting text files. This makes the program compatible with text files generated by other software packages. You specify whether you want the AppleWorks 3.0 word processor to import true tabs or substitute spaces for tabs. The spreadsheet module can use tabs to define each cell in a row, and the data base module allows importing and exporting of files with tabs between categories and Returns between records.

Other Enhancements: AppleWorks 3.0 makes it easier to view the list of files on a data disk; you can use the Apple-1 through Apple-9 commands and Apple-Up-Arrow and Apple-Down-Arrow to page through these directories.

Figure 3: New Spreadsheet Functions

Arithmetic Functions

@EXP	2.7182818 raised to a power.
@LN	The natural logarithm of a number.
@LOG	The base 10 logarithm of a number.
@MOD	The remainder of a division operation.
@PI	The decimal equivalent of *pi*.

Trigonometric Functions

@ACOS	Arccosine.
@ASIN	Arcsine.
@ATAN	Arctangent.
@ATAN2	Angle of a line defined by an x/y coordinate.
@COS	Cosine.
@SIN	Sine.
@TAN	Tangent.
@DEG	Converts radians to degrees.
@RAD	Converts degrees to radians.

Financial Functions

@IRR	Internal Rate of Return.
@FV	Future Value.
@PV	Present Value.
@TERM	Number of periods.
@PMT	Periodic payment.
@RATE	Rate.

Logical Functions

@FALSE	Displays "FALSE".
@ISBLANK	Displays "TRUE" if cell is blank; "FALSE" if not blank.
@ISERROR	Displays "TRUE" if a cell has an error, otherwise displays "FALSE".
@ISNA	Displays "TRUE" if a cell contains "NA", otherwise displays "FALSE".
@NOT	Displays "FALSE" if a test is true, otherwise displays "TRUE".
@TRUE	Displays "TRUE".

Figure 4: Printers Supported by AppleWorks 3.0

- Apple Daisy Wheel, Dot Matrix, ImageWriter I, ImageWriter II, ImageWriter LQ, Scribe, and Silentype.
- Brother HR10, HR20, HR25, and HR35.
- Diablo 36API and 630API.
- Epson MX, RX, and FX series printers.
- Juki 5500 series, 6100, 6200, 6300, and 6500.
- Okidata 82A, 83A, 84, 92, 93, 192, and 193.
- Panasonic KX-P1080, KX-P1091, and KX-P1092.
- Qume Sprint 5 and Sprint 11.

Earlier versions of AppleWorks use the caret mark (^) to command the end of a printer code. As a result, you cannot enter caret marks into printer definitions. AppleWorks 3.0 uses an Apple-Return to end a printer definition string, so you can enter printer codes that contain caret marks.

AppleWorks 3.0 incorporates a number of enhancements that are available as "patches" to earlier versions of the program. For example, if the computer locks up, you can press Control-Reset to return to the Main Menu. This lets you recover any files on your desktop when the computer froze.

If you have a IIGS or ProDOS-compatible clock in your IIe or IIc, AppleWorks 3.0 automatically reads the system date when you boot up the program. In addition, the program can print up to 255 copies of any document or report.

Limitations of the Program

While *Figure 2* summarizes the limitations and capacities of the program, there are other limits that are not apparent from this table.

AppleWorks 3.0 is a larger, more powerful program than the earlier versions of AppleWorks. The program and spelling dictionary fit on a single 3.5-inch disk; owners of 3.5-inch drives can use all its features without changing disks. If you use 5.25-inch disks, you will have to swap disks when you use the spell checking program in version 3.0.

AppleWorks 3.0 uses more memory than earlier versions of the program and leaves only 40K for the AppleWorks desktop on a 128K computer. That leaves room for about 12 pages of single-spaced text in a word processor document. (AppleWorks 2.0 and 2.1 leave 55K and 56K of desktop respectively.) If you currently just get by with 128K of memory, you will want to upgrade your system when you use the new version of AppleWorks.

AppleWorks 3.0 can read files from all previous versions of AppleWorks. However, once you use a feature that is new in AppleWorks 3.0, you cannot read that file with earlier versions of the program. For example, once you use tabs or the new Right Justify Command, the file is unusable with AppleWorks 2.1 or earlier. Similar constraints exist for the new features in all three modules.

Features Omitted from AppleWorks 3.0

While AppleWorks 3.0 includes more than seventy five features requested by users, it omits some capabilities that are important to power users of the program. One significant omission is the program's lack of built-in macros; an important capability for many intermediate and advanced AppleWorks users. (Claris considered including macros in the design specifications for version 3.0 but omitted this feature after determining that it added significant size and complexity to the program and to the documentation. TimeOut UltraMacros 3.0 adds macro capability and more to the new version of AppleWorks, and Claris will include a 50% discount coupon for UltraMacros in each AppleWorks 3.0 package.)

Another omission is the lack of date arithmetic in the spreadsheet. (Again, size and complexity were the constraints behind this omission.)

Finally, the advent of AppleWorks 3.0 will have a major impact on after-market accessories and enhancements for AppleWorks. AppleWorks 3.0 includes some of the features of the popular TimeOut enhancements to AppleWorks, but moving to AppleWorks 3.0 will require users to upgrade to

new versions of all their enhancement programs. *[Ed: For more information about AppleWorks 3.0 enhancements, see the article entitled "Enhancing AppleWorks 3.0" on page 11 in this issue of the **AppleWorks Forum**.]*

Conclusion

It is clear that Claris Corporation listened to its users when they planned this latest version of AppleWorks. Both Claris and Beagle worked for more than a year to insure that we got a versatile, quality product. While no program can satisfy every user, AppleWorks 3.0 represents a significant enhancement of the most popular productivity program in the history of Apple II computing.

FRENCH GERMAN

EuroWorks™

ITALIAN SPANISH

Type accented foreign text quickly and simply with the classic AppleWorks® word processor. Then, from **inside** AppleWorks, **EuroWorks** prints your foreign text on an ImageWriter® I or II or compatible printer.

Foreign files may include every character on your American keyboard plus 13 French, 7 German, 10 Italian, or 10 Spanish: just two sensible keystrokes per foreign character. Eight new symbols for English too: just three strokes each!

EuroWorks requires classic AppleWorks v2.0 or v2.1 USA and an Apple DMP, ImageWriter I or II, or Scribe; an MT85/86; or a Seikosha SP-1000AP printer. **EuroWorks** is compatible with, but does not require, the TimeOut™ series from Beagle Bros, Inc.

$20 for any ONE language
$30 for ALL FOUR

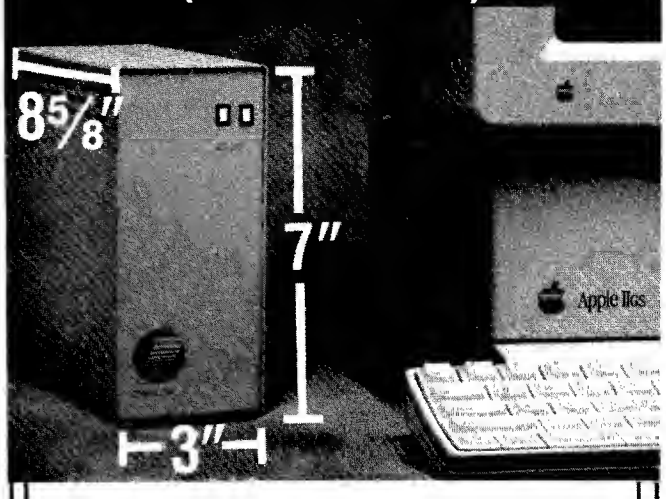
USA, Canada, Mexico postpaid; others add $3

AppleWorks®, ImageWriter® by Apple Computer, Inc.

Mail Check, MO, or Net-30 School PO to
The S.A. AuTeur Co: A70
P.O. Box 7459 Beaverton, OR 97007
(503) 645-2306

MasterCard VISA

Chinook Hard Drives.
Compact Mass Storage for every Apple II (even the IIc!)



CT-20c Disk Drive System

- Only hard drive for Apple IIc computers!
- Attaches to floppy disk port daisy-chain
- Compatible with all Apple floppy drives
- *Zip chip* compatible
- Supports DOS 3.3!
- Upgradeable to SCSI system. 20.5 megabytes formatted, 68 ms average seek time

SCSI Disk Drive Systems

- Compatible with Apple II+, IIe and IIGS
- Full range of capacities
- Complete with Apple SCSI controller card
- Full compatibility with new GS/OS, including new native mode driver for peak performance
- Chinook SCSI utilities for changing interleave and mapping out bad blocks (only utility available to map out bad blocks on a SCSI drive!)
- Partition between Macintosh and Apple II
- DOS 3.3 support included

All Chinook Disk Drive Systems Include

- Free technical support
- One year warranty on parts and labor
- Program selector, utility software
- To order, contact your local dealer or support your *AppleWorks Forum* advertisers

Chinook Technology, Inc.
601 Main Street, #635
Longmont, CO 80501
303-678-5007

CHINOOK

Canadian Customers: Please call Canadian Computer Outlet at 416-849-0737.

Apple II+, IIe, IIGS, IIc, IIc+ are registered trademarks of Apple Computer, Inc.
EasyDrive is a registered trademark of Quality Computers.
Zip Chip is a trademark of Zip Technology.

What You Should Know about Enhancing AppleWorks 3.0

by Cathleen Merritt and James Smith

For most users, AppleWorks is part of a software "system". We add spell checkers, memory expanders, and other enhancements to the program and maintain a family of products around the AppleWorks "core". Any change to AppleWorks means a change to the entire software system.

Users discovered the truth of this statement when we switched from AppleWorks 2.0 to 2.1. Although version 2.1 represented a minor upgrade to AppleWorks, none of the AppleWorks 2.0 enhancements worked with 2.1; we had to install new versions of all our enhancement programs.

"Most AppleWorks users will be happy with version 3.0 right out of the box."

This is particularly true with the development of AppleWorks 3.0. While earlier updates were limited to changes in the AppleWorks program code, version 3.0 includes changes to both AppleWorks and to the structure of the data files written by the program. Once again, we will need to update the enhancement programs we use with AppleWorks.

However, the task of updating is easier than with earlier conversions, primarily because AppleWorks 3.0 includes many of the features users must add as enhancements to earlier versions of the program. In addition, Claris Corporation worked closely with many third-party developers to help insure compatibility between their products and the new version of AppleWorks.

Here are the plans of the various companies that offer AppleWorks enhancements:

Beagle Bros

Users of TimeOut enhancements must update to version 3.0 of TimeOut and of each TimeOut module. The new TimeOut modules are compatible with versions 2.0, 2.1, and 3.0 of AppleWorks and include features not available on earlier versions of the TimeOut programs, so we recommend that you update even if you continue to use AppleWorks 2.0 or 2.1. Some of the enhancements are significant. For example, TimeOut 3.0 automatically builds additional TimeOut menus if you have more than 30 TimeOut modules; earlier versions of the program required you to manually build those extra menus. Modules like SuperFonts will give you a list of all word processor files on the desktop instead of displaying an error message if you try to use the program without a word processor file on the screen. And TimeOut QuickSpell will use a more powerful algorithm to suggest spellings; an algorithm Alan Bird developed for the spell checking program he built into AppleWorks 3.0. (If you plan to use AppleWorks 3.0, you will not need to update to the latest version of QuickSpell.)

In a gracious policy decision, Beagle will allow TimeOut owners to update their programs through the company's "Beagle Buddy" program instead of charging for the new versions of the program. Starting July 15, **NAUG** members can get these versions from our Beagle Buddies, Bruce Shanker or Oliver Roosevelt. To update, send your **NAUG** member number, return address, payment, and original TimeOut disk(s) to **NAUG**'s Beagle Buddies at either of the following addresses:

Bruce Shanker, 1279 Boyd Road, Warminster, Pennsylvania 18974.

Oliver Roosevelt, Box 303, Fairforest, South Carolina 29336.

The cost is $2.50 for the first 5.25-inch disk and $1 for each additional 5.25-inch disk, or $3 for the first 3.5-inch disk and $2 for each additional 3.5-inch disk. Enclose a check or money order in U.S. funds payable to Bruce Shanker or Oliver Roosevelt (not to **NAUG**). Do not send cash, credit card numbers, or purchase orders. Orders shipped outside North America require an additional $2 per disk for postage.

Bruce Shanker also offers overnight delivery to U.S. addresses by Express Mail for $12 additional per order.

Non-members can obtain TimeOut updates from a local users group or directly from Beagle Bros, 6215 Ferris Square, Suite 100, San Diego, California 92121; enclose your original TimeOut disk(s) and payment of $10 per disk.

Later this summer, Randy Brandt and Mark Munz will introduce an AppleWorks 3.0 Companion Disk with a series of useful AppleWorks enhancements. More information about this product will appear in next month's issue of the ***AppleWorks Forum***.

Applied Engineering

Most owners of Applied Engineering cards will be able to use AppleWorks 3.0 right out of the box. (AppleWorks 3.0 automatically recognizes and uses RamWorks cards; previous versions of AppleWorks required a patch supplied by Applied Engineering that modified AppleWorks to recognize those cards.)

In addition, many of the enhancements formerly available only with the Applied Engineering AW 2 Expander program are built into AppleWorks 3.0. For example, the size of the clipboard in the new version of AppleWorks is limited only by available memory, and AppleWorks 3.0 allows more than 16,000 lines in word processor documents and 16,000 data base records; earlier versions of AppleWorks had much smaller limits, unless expanded with the AW 2 Expander.

Despite the high level of compatibility between Applied Engineering products and AppleWorks 3.0, Applied plans to release an update to their AW 2 Expander software. This product will let users store more than 22,000 records in a data base file, will segment files too large to fit on a single data disk, and will add other enhancements to AppleWorks. The company has not finalized its design of this product; additional information will appear in a forthcoming issue of the ***AppleWorks Forum***.

Meanwhile, users with large word processor documents (more than 16,000 lines) or data base files (more than 16,000 records) should continue to use older versions of AppleWorks until Applied's AW 3 Expander becomes available later this summer.

Checkmate Technology

AppleWorks 3.0 is compatible with all Checkmate Technology memory cards, although not compatible with RAM disks on those cards. The company considers the new limits of AppleWorks 3.0 adequate, but plans to develop enhancement software to (a) let Checkmate owners use RAM disks with AppleWorks 3.0, and (b) enhance AppleWorks 3.0 so it segments large files that will not fit on a single floppy disk. **NAUG** will announce a planned release date for this enhancement program in a future issue of the ***AppleWorks Forum***.

Pinpoint Publishing

Pinpoint Publishing is no longer in business, and the company's AppleWorks enhancements are not compatible with AppleWorks 2.1 or 3.0. In addition, Pinpoint Document Checker, an excellent stand-alone spell checking program, cannot read AppleWorks 3.0 word processor files that use the new features of the program.

Beagle Bros offers a trade-in program for Pinpoint owners who want to update to the TimeOut series of AppleWorks enhancements; see the May issue of the ***AppleWorks Forum*** for the details of that offer.

Patching Programs

AppleWorks 3.0 incorporates many of the enhancements included in the various patching programs on the market, and these programs are not compatible with the new release of AppleWorks.

Randy Brandt, owner of JEM Software, wrote a significant portion of the code in AppleWorks 3.0 and incorporated many of the popular patches on JEM's PatchMania and Late Nite Patches disks right into AppleWorks.

John Link just announced version 5.0 of the most powerful patching program, SuperPatch. Version 5.0 offers more than 65 patches to AppleWorks versions 2.0 and 2.1, but is not compatible with AppleWorks 3.0. (SuperPatch 5.0 costs $20 from John Link, 3382 Sandra Drive, Kalamazoo, Michigan 49004.)

AppleWorks 3.0 offers more printer options than earlier versions of AppleWorks; most programs that modify AppleWorks' printer driver are no longer necessary with version 3.0. For example, AppleWorks 3.0 supports up to three custom printers and lets you specify up to six custom printer codes with any printer. Most printer driver modifiers like the Dr. Schultz Disk, the Printer Code Editor, and the AppleWorks 2.1 Printer Enhancement Disk (all available from the **NAUG** Public Domain Library) are not compatible nor necessary with AppleWorks 3.0.

Stand-Alone Programs

Most stand-alone programs, like spell checkers and grammar checkers, analyze or use AppleWorks data files. Programs that analyze AppleWorks word processor files are most likely to be compatible with version 3.0 files. For example, Sensible Speller and Sensible Grammar work with AppleWorks 3.0 word processor files (as mentioned earlier, Pinpoint Document Checker does not).

Programs that use the current version of TaskMaster (a run-time version of UltraMacros) are not compatible with AppleWorks 3.0. Randy Brandt (author of UltraMacros and TaskMaster) will release a 3.0-compatible version of TaskMaster later this summer; authors of the stand-alone programs will incorporate this version into their products. You should not expect AppleWorks 3.0-compatible versions of these programs until fall. (You can tell if your program uses TaskMaster if a TaskMaster screen appears when you boot the program.)

The current version of RepairWorks (a program that recovers damaged word processor and data base files) is not compatible with files that use the new features of AppleWorks 3.0. Quality Computers will release a 3.0-compatible version of that program shortly.

Cross-Works is a data conversion and file transfer program that makes it easy to transfer files between AppleWorks and popular MS-DOS programs like Word Perfect, Lotus 1-2-3, and dBase III and IV. The current version of Cross-Works converts AppleWorks 3.0 files that do not use the new features added to AppleWorks. SoftSpoken will release an AppleWorks 3.0-compatible version of Cross-Works this fall and will notify registered owners of the availability of this upgrade.

Conclusion

AppleWorks 3.0 adds significant features to AppleWorks, including many of the features you must add as options to earlier versions of the program. Most AppleWorks users will be happy with version 3.0 right out of the box. The rest of us will soon be able to add our favorite enhancements to this new version of AppleWorks.

AppleWorks ⇔ IBM

CROSS-WORKS™ automatically transfers and converts data files between AppleWorks and popular software on the IBM PC:

AppleWorks Word Proc. ⇔ WordPerfect
AppleWorks Spreadsheet ⇔ Lotus 123
AppleWorks Data Base ⇔ dBase III +

It's easy! Just select file names from the menu. In seconds, **CROSS-WORKS** copies the files in either direction between your Apple II and IBM PC, and translates the file formats. Word processor files maintain all underlining, margins, centering, etc. Spreadsheets transfer data **and** formulas! Includes universal direct-connect cable (IIe, IIc, & IIgs to PC, XT, AT, PS/2 & compatibles) for fast **19,200 baud** transfers. Also supports remote modem transfers. Both 5¼ and 3½ inch disks are supplied.

CROSS-WORKS
Only $79.95 complete!

Call **(919) 878-7725** today for free information packet.

*Soft*Spoken
P.O. Box 97623
Raleigh, NC 27624

AppleWorks 3.0: My Favorite Features

by Randy Brandt

Randy Brandt, one of the authors of AppleWorks 3.0, gives his insights into the new version of AppleWorks.

Ask a software developer about his or her favorite features in a product they helped develop and you will probably hear about features the documentation barely mentions. AppleWorks 3.0 is no exception. So here is a list of my favorite features you might miss when skimming through the new manuals, or might not be able to find even if you tried.

Dates and Checkmates

I was responsible for developing the data base and desktop enhancements for AppleWorks 3.0 (code named "Spike"); I spent about equal time on each project. You already read about the new date and time features *[Ed: Enter an @ sign in a "DATE" category and AppleWorks 3.0 enters the current date; enter an @ sign in a "TIME" category and the program enters the current time.]*, but you probably didn't know that Spike can automatically print the date in the heading of data base and spreadsheet reports. When you're prompted for a report date, enter "@" and press Return — Spike does the rest.

Alan Bird made a major contribution when he wrote the memory manager for auxiliary slot memory cards such as Applied Engineering's RamWorks and Checkmate's MultiRam. You no longer need worry about memory board compatibility; AppleWorks 3.0 is now compatible with all popular peripheral slot and auxiliary slot memory cards. This is especially significant for TimeOut users with auxiliary slot cards; you can now make full use of TimeOut Paint, Triple Clipboard and other TimeOut enhancements, even with large word processor and data base files.

Lazy Loads and Smart Saves

Here's an undocumented AppleWorks 3.0 command that can be handy. If you press Apple-Right Arrow when adding files to the desktop, AppleWorks will automatically select enough files to reach the twelve-file desktop limit. For example, if you have three files on the desktop, pressing Apple-Right Arrow will select nine files starting from the currently highlighted file.

AppleWorks' SmartSave feature is a carryover of something we learned from the Macintosh computers we used to write Spike. (Yes, your favorite Apple II program was written on a Macintosh! We used the Macintosh Programmer's Workshop on Mac II's. The Programmer's Workshop is a "cross-compiler" that lets us use the power of the Macintosh to write Assembly Language programs that run on the Apple II.) Most Macintosh programs remember the source of each file on the desktop; issue a Save Command and the Macintosh saves the file back in the original subdirectory on the correct disk. So I added the feature to AppleWorks. Press Apple-Control-S when you save a file and AppleWorks will restore the file's original pathname before saving the file. Press Apple-Return after you select "Save all files" at the Main Menu and AppleWorks 3.0 will automatically save all selected files to their original directories. This is especially handy for hard disk users. Anyone who uses subdirectories will find that the days are brighter and birds' songs are sweeter..

When changing the current disk, I like to change subdirectories easily by picking them from a list, so AppleWorks 3.0 automatically lists your subdirecto-

ries when you highlight "ProDOS directory" on a menu. However, if you like to type them in, you can press Apple-Return when you highlight "ProDOS directory". (My thanks to **NAUG** member Dave Gair for this excellent idea.)

Improved Integration

One of my favorite features is Spike's enhanced clipboard that is limited only by desktop memory; you can copy entire files into this clipboard. Even more impressive, you can now paste the contents of the clipboard into any of the three AppleWorks modules. Alan Bird's TimeOut Data Converter provided the core routines for this feature, although we enhanced them further. For example, you can now create data base records taking advantage of the editing and spell checking features of the word processor, and then paste the entries into the data base.

Transferring formatted data from the data base to the word processor is as simple as arranging your data base categories in the desired order, copying records to the clipboard, and pasting them into the word processor file. Likewise, you can transfer a spreadsheet into a word processor file with just a few keystrokes.

Clever Commands

You know how I feel about the features UltraMacros adds to AppleWorks, so I built a few UltraMacros commands into Spike. For example, Apple-Delete Key now deletes the character under the cursor. And Apple-Right Arrow and Apple-Left Arrow jumps a word at a time in all three AppleWorks modules.

Powerful Printing and Super Spreadsheets

Rob Renstrom made some great printer improvements. My favorite is the ability to define up to six custom codes for each printer. You can insert the commands for these codes in your documents by selecting a new Special Codes choice on the Options Menu. For example, ImageWriter users can now enter "Red Begin" and "Red End" for color printing; Epson owners can add codes for italics. Put the cursor on the caret representing your code, and its name appears on the bottom of the screen just like a built-in code!

Rob also greatly enhanced the power of the spreadsheet. I'll never need 9,999 rows or the new exotic calculating functions, so I think the ability to reference text strings is the most significant improvement to this module. For example, a spreadsheet cell can now display a product name based on a number in another cell; that makes tasks like invoicing incredibly simple. Teachers will use this feature to automatically calculate letter grades based on test scores.

Some Interesting Background

The AppleWorks 3.0 project was code-named "Spike". Why Spike? We're Beagles, so Claris decided to adopt a Charlie Brown theme for the project. We were Snoopy and Claris was Charlie Brown. Snoopy's brothers are Spike and Olaf, so AppleWorks 3.0 took on the code name Spike and the network version became Olaf. Claris' Apple II champion, John Kinder, did the programming necessary to convert Spike to Olaf. He also had the delightful job of trying to keep us working on those nasty bug reports. I gave him a hard time, but he deserves a lot of credit, along with Product Manager Elisa Nakata and all the testers at Claris. Rob Burns, Robert Morris, and Kerry Riggs deserve to be singled out for bearing the bulk of the testing load.

A special thanks to AppleWorks' author Robert Lissner for making the whole AppleWorks industry possible. His source code was a pleasure to work with; I feel honored just to be a part of his masterpiece program.

Conclusion

AppleWorks 3.0 represents many thousands of hours of effort by the Beagle and Claris teams. We used our personal experience with AppleWorks and the suggestions you submitted to Claris and **NAUG** to create a productivity tool of which you can be proud. Now get your update and show Apple that the II family is still strong, and more than just a K-6 machine! I'm looking forward to future issues of the ***AppleWorks Forum*** that will include the AppleWorks 3.0 tips and techniques you discover.

[Randy Brandt, the owner of JEM Software, is the author of UltraMacros, PowerPack, and other AppleWorks enhancements.]

Branching Spreadsheets: How to Use @LOOKUP

by Warren Williams and Cathleen Merritt

This is the third in a series of articles that describe how to prepare spreadsheets that "branch". Previous articles describe how to use the @IF and @CHOOSE functions. This month the authors describe how to use @LOOKUP to add branching capability to AppleWorks.

The first two articles in this series describe how to use the @IF and @CHOOSE functions to create spreadsheets that follow different paths depending on the value in a particular cell. The @IF function lets you choose between two alternative branches; @CHOOSE lets you develop as many as 11 branches.

While @IF and @CHOOSE look for specific values in a cell, there are times you need a spreadsheet to branch depending on a *range* of values. For example, imagine that you are developing a spreadsheet that pays salespeople different commissions depending on the gross volume of their sales in a quarter. A person who sells between $0 and $49,999 earns a 1% commission, a person who sells $50,000 to $99,999 earns a 1.5% commission, and so on. The @IF and @CHOOSE statements do not handle these ranges of values efficiently; this is the domain of @LOOKUP.

Figure 1: Example of @LOOKUP Function

```
========A========B========C========D========E========F====
  1|  $39.80
  2|           $200.00 ———————————— @LOOKUP(A1,B5...F5)
  3|
  4|
  5|Value       $0.00   $20.00   $40.00   $60.00   $80.00
  6|Return    $100.00  $200.00  $300.00  $400.00  $500.00
  7|
```

@LOOKUP

@LOOKUP is appropriately named; it "looks up" a value or formula in a table. Consider the formula @LOOKUP(A1,B5...F5) in cell B2 in *Figure 1*. This formula compares the value in cell A1 to the numbers in the table in cells B5 through F5. AppleWorks replaces the formula with the appropriate value from that table.

Syntax of @LOOKUP

Every @LOOKUP statement follows this structure:

@LOOKUP(test, tablestart...tableend).

The "test" is the cell you want to compare to the "table". The "table" is a series of cells that contain values, cell references, or formulas that will appear in place of the @LOOKUP statement.

Once again, consider the @LOOKUP statement that appears in *Figure 1*. This formula says, "Compare the number in cell A1 to the values in cells B5 through F5. Find the cell in B5 through F5 that contains the same number as in A1 and display the number that is in the cell below the cell you identify. If no number exactly matches the number in A1, check cells B5 through F5 for the next lower number and display the number in the cell below the cell you identify."

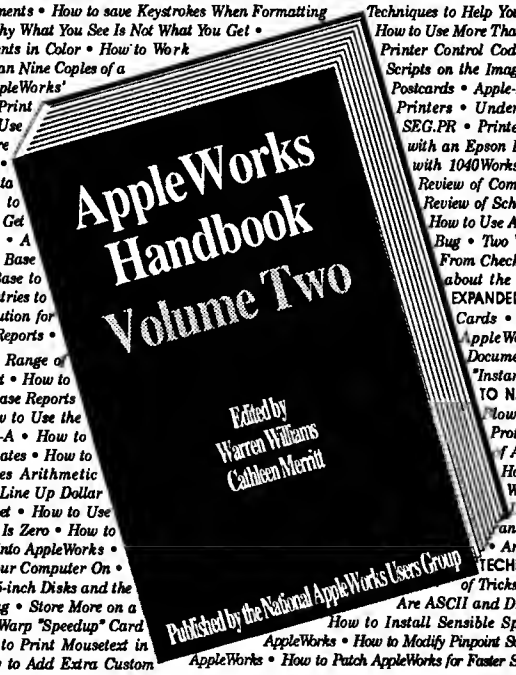
In *Figure 1*, the value in cell A1 is $39.80, and cells B5 through F5 do not contain a matching number. Cell C5 contains a value of $20.00, the closest lower number, so AppleWorks replaces the @LOOKUP formula with the number $200.00, the value in cell C6.

Another Example

Figures 2A and 2B present two similar examples of simple @LOOKUP functions. These spreadsheets are functionally identical; tables can appear in either

Add this 'How To' book to your AppleWorks library.

WORD PROCESSING TIPS • *How to Prepare Tables for a Document • How to Insert Tabs in a Document • How to Create an Printers • How to Add Up to Three Custom Printers • Interface Cord Settings • Index • How to Create a Table of Contents • How to Bold Print Documents • How to save Keystrokes When Formatting Techniques to Help You Print on Labels • Patch AppleWorks for Faster Startup • Documents • Sticky Spaces: What They Are and How to Use Them • Why What You See Is Not What You Get • How to Use More Than Three Printer Setups • How to Enter Control-@ Symbols in How to Print Three-Line Headers • How to Print AppleWorks Documents in Color • How to Work Printer Control Codes • How to Use an Okidata Printer • Better Super/Sub-Around a Bad Key • How to Print a Single Page • How to Get More Than Nine Copies of a Scripts on the Image Writer II • How to Print on Different Length Paper and Document • How to Automatically Print Page Numbers • Improving AppleWorks' Postcards • Apple-H Printer Problems • Configuring Panasonic and Spiril 80 "Tab" System • How to Get Footnotes in a Document • How to Print Printers • Underlining on Epson and Spirit 80 Printers • How to Copy Addresses on Envelopes • How to Avoid Wide Right Margins • How to Use SEG.PR • Printer Control Codes in AppleWorks • Get Better Quality Print the Clipboard with Mail Merge • DATA BASE TIPS • How to Get More with an Epson Printer • TEMPLATES AND PROGRAMS • Doing Your Taxes Than Three Selection Rules • How to Print 3-Across Mailing Labels • with 1040Works • A Review of RAMUP • A Review of Paint-to-Paint • A How to Enter Repeated Data into Records • How to Underline in Data Review of CommWorks • Business Templates in NAUG's PD Library • A Base Reports • How to Keep Your Tax Records • Using AppleWorks to Review of SchoolWorks • How to Use Keyboard Macros with Templates • Teach Social Studies • How to Change Single Record Layout • How to Get How to Use AutoWorks as a Disk Librarian • Pinpoint Document Checker the Data Base to Count • How to Get Totals in Data Base Reports • A Bug • Two Views of Printrix • Some Tricks with SideWays • Quicken: Technique to Handle Dates in Data Bases • How to Integrate the Data Base From Check Register to a Spreadsheet • Why Do I Get ~s? • Comments and Spreadsheet Modules • How to Move Group Totals from Data Base to about the TimeOut Series • More Help with Document Checker • Spreadsheet • How AppleWorks Stores Your Data • How to Convert Entries to EXPANDED MEMORY • How to Create Auto-Boot Disks for Checkmate Date Format • How to Handle Hyphens in Data Base Files • A Solution for Cards • How to Create Auto-Boot Disks for RamWorks Cards • Data Base Printing Problems • How to Avoid "#" Signs in Data Base Reports • AppleWorks 2.0, 2.1, and RamWorks Cards • Using Pinpoint How to Use Super/Sub-Scripts in the Data Base • How to Enter a Range of Document Checker • Help For RAM Disk Users • A RAMUP Tip • Times in the Data Base • How to Round Calculated Fields in a Report • How to "Instant" AppleWorks • Auto-Boot Disk and AutoWorks • LETTERS Print Directly on 3.5" x 5" Cards • How to Avoid Line Wraps in Data Base Reports TO NAUG • How to Reduce Keystrokes and Disk Swapping • • SPREADSHEET TIPS • AppleWorks' Built-in Pop-up Calculator • How to Use the Blown Disk and Printer Interface Card Settings • Password Arrange Command • Design a Spreadsheet So You Can Use Apple-A • How to Protecting Data • Check Your Joystick • Save Your Old Copies Transfer Data Between Spreadsheets • How to Improve Your Tax Templates • How to of AppleWorks • NOVICE NOTES • How to Use Mail Merge • Simulate Decision Support Software • How AppleWorks Handles Arithmetic How to Avoid Losing Your Work • Data Base or Spreadsheet: Operations • How to Move Columns between Spreadsheets • How to Line Up Dollar Which One Is Best? • How to Use Templates • An Amounts in Spreadsheets • Limitations of the AppleWorks Spreadsheet • How to Use Introduction to RAM Disks • How to Recover Deleted Text @Round in the Spreadsheet • How to Get Blank Cells When the Value Is Zero • How to and Records • How to Use AppleWorks with a 3.5-inch Drive Format Blank Cells in a Spreadsheet • How to Transfer Visicalc Files into AppleWorks • • An Easier Way to Use the Mail Merge Clipboard • ADVANCED APPLEWORKS HARDWARE • Operating Speed of AppleWorks • Leave Your Computer On • TECHNIQUES • How to Restore AppleWorks Data Disks with "Bag Backup Power Sources • Disk Drive Problems with the Apple IIGS • 3.5-inch Disks and the of Tricks" • Solutions to Printer Problems with a RAM Disk • What Apple IIc • Software for the Apple /// • Overcoming a Checkmate Bug • Store More on a Are ASCII and DIF Files? • How to Convert ASCII Files into AppleWorks • Memory Card • Free "Upgrade" for Apple IIGS Owners • Using a TransWarp "Speedup" Card How to Install Sensible Speller on a Network • How to Set Up Version 2.0 and 2.1 of • AppleWorks and a Standard Television • PRINTER PRIMER • How to Print Mousetext in AppleWorks • How to Modify Pinpoint So It Does Not Dial a "1" • How to use the IIGS System Clock with AppleWorks • How to Print on Postcards and 3" x 5" Cards • How to Add Extra Custom AppleWorks • How to Patch AppleWorks for Faster Startup • How to Get the "^" Symbol in a Printer Control Code.*



Special NAUG member prices

☐ Send me the *AppleWorks Handbook: Volume Two.* Enclosed is $25.95 (regularly $27.95) + $3 shipping / $8 foreign.
Total Enclosed $_____

☐ Check ☐ MasterCard ☐ VISA

Credit Card # _____ Expires _____

Signature _____

Phone # _____

Name _____

Address _____

_____

City _____ State_____ Zip _____

Send to:
National AppleWorks Users Group
Box 87453
Canton, Michigan 48187
(313) 454-1115

NAUG ships via UPS

Your satisfaction is guaranteed or your money back.

Volume Two of the AppleWorks Handbook is the authoritative "How To" guide for AppleWorks. The handbook includes 200 two- to five-page tutorials that illustrate the step-by-step procedures required for dozens of AppleWorks applications. Each article is important, concise, and well-written.

- *Hundreds of creative tips, techniques, and ideas.*
- *Important articles for every level of experience: novice, intermediate, and advanced.*
- *An excellent teaching and reference guide for educators and consultants.*
- *More than 500 pages; 200 articles – An exceptional value.*

The AppleWorks Handbook: Volume Two presents the best articles from the 1987 issues of the AppleWorks Forum. These articles represent the collective experience of the many experts who contribute to the publication. No other book so effectively describes the full range of AppleWorks functions and applications.

NEW!

NAUG Public Domain Catalog

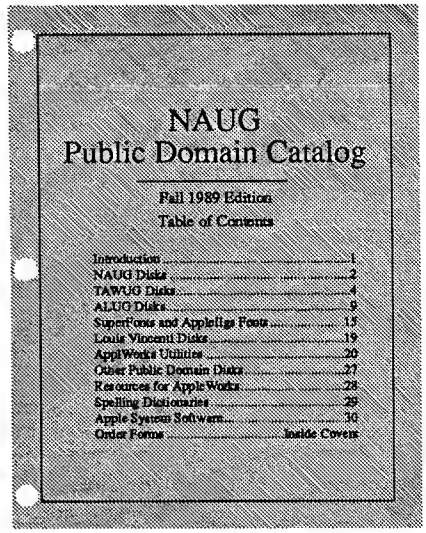
The Fall 1989 edition of the **NAUG** Public Domain Catalog is ready. The 32-page catalog lists hundreds of templates, fonts, AppleWorks enhancements and utilities that are in the public domain and are available from **NAUG**.

The catalog costs $5 and includes a rebate coupon worth $2, valid on your first order of public domain disks.

For a copy of the catalog, send this card with your payment to:

National AppleWorks Users Group, Box 87453, Canton, Michigan 48187, (313) 454-1115.

NAUG POLICY: SATISFACTION GUARANTEED OR YOUR MONEY BACK.



NAUG
Public Domain Catalog

Fall 1989 Edition
Table of Contents

☐ Please send me _____ Public Domain Catalogs @ $5

☐ Orders outside North America require $2 postage

☐ Check enclosed ☐ VISA ☐ MasterCard

Credit Card # _____ Expires ____

Signature _____

Name _____

Address _____

_____

City_____ State_____ Zip _____

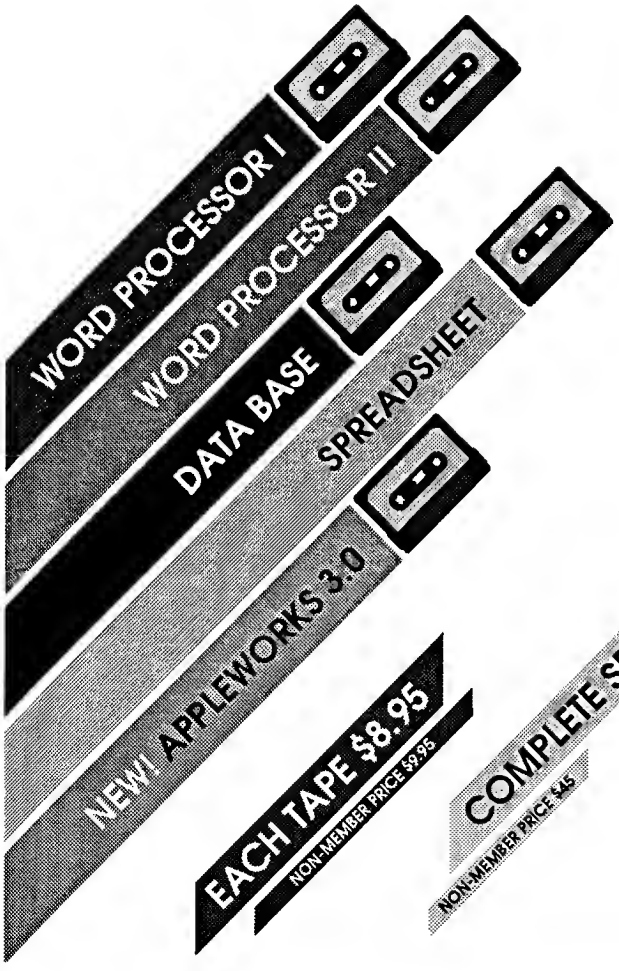
Phone _____

AppleWorks then.

Introducing the most powerful, most versatile AppleWorks® in history.

AppleWorks 3.0, with everything you expect from AppleWorks. Plus a lightning-fast spell checker. Advanced spreadsheet functions. More mailing labels across a page. Built-in support for more printers and memory cards. An expanded, easier-to-use clipboard. An even bigger spreadsheet, word processor and data base. And more.

© 1989 Claris Corporation, 5201 Patrick Henry Drive, Box 58168, Santa Clara, California 95052; 408-727-8227. Claris is a trademark of Claris Corporation. AppleWorks is a registered trademark of Apple Computer, Inc., licensed to Claris Corporation. Apple is a registered trademark of Apple Computer, Inc.



The National AppleWorks Users Group presents a special five-volume audio cassette package,

APPLEWORKS: BEYOND THE BASICS

with Dr. Warren Williams

Here is the chance for you to "attend" NAUG's popular AppleWorks seminar in the comfort of your home or car. This series of five one-hour lessons describe more than 100 tips and techniques to enhance your knowledge of AppleWorks. Dr. Williams has a relaxed, informal style that makes for interesting and informative listening. We know you'll find these tapes very worthwhile.

SATISFACTION GUARANTEED OR YOUR MONEY BACK

AppleWorks now.

In fact, AppleWorks has expanded in all directions. But it still runs on a modest 128K. Very fast.

For more information, call Claris at 800-628-2100. We'll race you a copy of the AppleWorks upgrade.

Then your Apple II will cover even more ground than it does now.

Introducing AppleWorks 3.0. CLARIS

APPLEWORKS: BEYOND THE BASICS

ORDER FORM

Each tape is an individual lesson that helps you become more efficient and productive with AppleWorks. Dr. Warren Williams, author of more than 100 articles on AppleWorks, narrates these tapes that reflect the content and style of NAUG's national "AppleWorks: Beyond the Basics" seminars.

RETURN TO:
National AppleWorks Users Group
Box 87453
Canton, MI 48187
(313) 454-1115

Qty.		NAUG Member	Non-Member	Total
____	Volume One: Word Processor Tips I	@ $8.95	$9.95	$ ____
____	Volume Two: Data Base Tips	8.95	9.95	____
____	Volume Three: Spreadsheet Tips	8.95	9.95	____
____	Volume Four: Word Processor Tips II	8.95	9.95	____
____	Using the New Features of AppleWorks 3.0	8.95	9.95	____
____	Set of Five Tapes	$40.00	$45.00	____
____	Foreign Postage	@ $2.00 each tape		____
			Total Amount	$ ____

☐ Check ☐ MasterCard/Visa

Credit Card # _____

Expiration _____

Signature _____

Telephone _____

Name _____ NAUG Member # _____

Address _____

City, State, Zip _____

NATIONAL APPLEWORKS USERS GROUP

presents

The AppleWorks Wall Chart

NAUG's AppleWorks Wall Chart is a 35" x 23" two-color reference source with important information for AppleWorks users. The Wall Chart includes the control codes for more than one hundred popular printers, summaries of the AppleWorks commands, a diagram of the relationship between the AppleWorks modules and a chart depicting NAUG's AppleWorks Bulletin Board commands. The chart is an excellent resource for microcomputer laboratories, instructors, and consultants. Recommended in A+ magazine by Gary Little of Apple Computer.

NAUG members - $6.95 ◆ Non-members - $7.95

Total

☐ Please send me ____ AppleWorks Wall Charts @ $6.95. ____

☐ Orders outside North America add $2 foreign postage. ____

Total: $____

☐ Check enclosed ☐ VISA ☐ MasterCard

Credit Card # _____ Exp. Date _____

Signature _____

Name _____

Address _____

_____

City _____ State _____ Zip _____

Phone _____

Mail completed form to: National AppleWorks Users Group, Box 87453, Canton, Michigan 48187. (313) 454-1115

NAUG POLICY: SATISFACTION GUARANTEED OR YOUR MONEY BACK.

Figure 2: Exploring @LOOKUP Effects

A

```
=====A====B======C====D===E=====F=====G=====H=====I=====J====
 1|
 2|   Test Value --> 17
 3|   Result ------> .6
 4|
 5|                   0   10    15    20    25    30    35
 6|                   0   .5    .6    .7    .8    .9     1
 7|
                @LOOKUP(D2,D5..J5)
```

B

```
=====A====B======C====D=====
 1|
 2|   Test Value --> 17
 3|   Result ------> .6
 4|
 5|         0       0
 6|        10      .5
 7|        15      .6
 8|        20      .7
 9|        25      .8
10|        30      .9
11|        35       1
12|
          @LOOKUP(D2,B5..B11)
```

C *Sample Output from the @LOOKUP Command*

If cell D2 contains	*Value in D3*
5	0
10	.5
11	.5
15	.6
19.9	.6
19.99999	.6
34	.9
35	1.0
129	1.0

horizontal or vertical format. In addition, note that there are no labels attached to the table; the labels in cells A5 and A6 in *Figure 1* are optional.

The spreadsheet in *Figures 2A* tests the value in cell D2 against the values in cells D5 through J5. The spreadsheet in *Figure 2B* tests the value in cell D2 against the values in cells B5 through B11.

Figure 2C shows the value that appears in cell D3 when you enter different numbers into cell F5. In each case, the @LOOKUP function checks for a table value that exactly matches the value in cell D2. If it does not find an exact match, it looks for the next lower number and displays the value in the adjacent cell. For example, the table does not contain an exact match for the value 19.99999. The next lower number in the table is 15 (in cell F5 in *Figure 2A* and in cell B7 in *Figure 2B*), so AppleWorks displays the value .6, the number in the cell adjacent to the cell that contains the value of 15. Study this example before proceeding with this article; you must understand the basic operation of the @LOOKUP statement before proceeding.

Once you feel comfortable with the @LOOKUP formula in *Figure 2*, try to predict the number that will appear in cell D3 when cell D2 contains the numbers 1, 9, 9.9, 10.0, 10.1, 32, and 3298472.

Here are the answers: 1 → 0; 9 → 0; 9.9 → 0; 10 → .05;10.1 → .5; 32 → .9; 3298472 → 1.0.

Some Rules for @LOOKUP

All @LOOKUP tables must adhere to the following rules:

1. @LOOKUP tables can appear in horizontal or vertical format. Unlike Lotus 1-2-3 and other spreadsheet programs, you do not have to tell AppleWorks whether the table is formatted horizontally or vertically; AppleWorks determines the format from the cell references in the @LOOKUP formula.
2. The "reference cells" (the left-hand column in a vertical table; the top row in a horizontal table) must contain numbers; the cells cannot contain text, cell references, or formulas.
3. The reference cells must be organized in ascending order. The first cell must contain the smallest number and the following cells must contain increasingly larger numbers.
4. The "result cells" (the right-hand column in a vertical table; the bottom row in a horizontal table) can contain numbers, cell references, or formulas. If you have version 3.0 or later of AppleWorks, reference cells can also contain text or references to cells that contain text. Versions 2.1 and earlier only allow numbers, formulas, or cell references in @LOOKUP formulas.

5. Unlike the reference cells, you can list result cells in any order.

A Gradebook Example

Let's explore some applications of the @LOOKUP function. (Our examples work with all versions of AppleWorks and do not use a new feature of AppleWorks 3.0 that lets you use @LOOKUP to display text. The next article in this series will describe the power AppleWorks 3.0 adds to branching spreadsheets.)

Figure 3 contains a spreadsheet that uses @LOOKUP to compute students' grades depending on their average test and project scores.

Figure 3: Gradebook Example

```
=======A=======B=======C=======D=======E=======F=======G=====
  1|Teacher: Roberta Silfen
  2| Period: 2
  3|  Class: U.S. History
  4|                                                    Grade
  5|Name                 Midterm Final Project Average  Code
  6|-------------------- ------- ----- ------- ------- -----
  7|Dalton    Frederick       82    74      90      82     2
  8|Esch      Thomas          55    50      60      55 #####
  9|Gillman   Cynthia         70    75      70      72     3
 10|
 11|

=======A=======B=======C=
 49|  Average    Grade
 50|        0 99999999
 51|     64.5        4
 52|     69.5        3
 53|     79.5        2
 54|     89.5        1
 55|   100.01    ERROR
 56|
```

@AVG(C9..E9)

@LOOKUP(F9,A50..A55)

We want the spreadsheet to display letter grades of "A" through "E", but the @LOOKUP function in AppleWorks 2.1 and earlier can only display numbers. So we design our gradebook to assign a "Grade Code" instead of a letter grade. A Grade Code of "1" (equivalent to a grade of "A") appears for students with averages over 90, a Grade Code of "2" (equivalent to a grade of "B") appears for students with averages between 80-89, a "3" for students with averages between 70-79, and a "4" for students with averages between 65-69. We want the gradebook to draw attention to anyone with a grade under 65, so we design the spreadsheet so a series of "#" signs appears in the grade column for those students. (Pound signs appear because the number in cell B50 is too large to fit in the Grade Code column. AppleWorks automatically displays "#" signs to represent numbers too large to fit in a cell.)

The @LOOKUP function in Column G determines the Grade Code. The formula `@LOOKUP(F9,A50...A55)` in cell G9 says, "Compare the value in cell F9 to the table of values in cells A50 through A55. Display the corresponding number from the list that appears in cells B50 through B55."

In this case, AppleWorks compares the number in cell F9 to the list of numbers starting in cell A50. If a number in cells A50 through A55 exactly matches the value of cell F9, the @LOOKUP formula displays the number in the cell to the right of the matching number. If no number exactly matches the value in cell F9, the program looks through cells A50 through A55 until it encounters the first number that is larger than the value in cell F9. Then AppleWorks returns to the previous cell in the list and displays the number to the right of that cell.

For example, cell F7 contains Frederick Dalton's overall average: 82. Since no number in cells A50 through A55 exactly matches Frederick's average, the formula in cell G7 says, "Look in cells A50 through A55 for the first number that is higher than 82." (That number is 89.5 in cell A54.) Then move to the next lower number on the list (79.5 in cell A53) and display the number to the right of that cell. That is how the formula determined that a "2" should appear in cell G7.

"Flags" and Error Checking with @LOOKUP

In *Figure 3*, the table in cells A50 through B55 has two unusual elements.

1. If a student's score falls below 64.5, the @LOOKUP function tries to display the contents of cell B50 (99999999). The number 99999999 is too large to fit in cell G8, so

Figure 4: Invoice Example

```
=======A=====B======C====================D====================E==========F=======G==
  1|                              XYZ Corporation
  2|                                 Box 3123
  3|                            Summitsville, NY  12420
  4|                                (718) 555-1234
  5|
  6|Customer: Zebra Stripes Clothing                    Date: August 31, 1991
  7|          140 E. 6th Street                         Ship: via UPS
  8|          New York, NY  10022                        PO#: 23-160
  9|                                                     Tax: 6.5%
 10|
 11|    Qty.  Cat No.  Description                        Unit    Total
 12|    ----  -------  -----------------------------------  ----  --------
 13|    1000  221-360  Buttons, 1/4-in pearl & cyan        .030    $30.00
 14|     400  A634-10  Clips/Talon, chrome                 .040    $16.00
 15|    1000  221-365  Buttons, 3/16-in pearl-cream        .025    $25.00
 16|     500  A528-70  Snaps-w/o fabric insert-black      .035    $17.50
 17|    ------------------------------------------------------  --------
 18|                                                  Subtotal:    $88.50
 19|                                                Adjustment:    $10.00
 20|                                                       Tax:     $6.40
 21|                                                  Shipping:     $2.50
 22|                                                            ========
 23|                                                     TOTAL:   $107.40
 24|                                                            ========
 25|                      We Appreciate Your Business.
 26|
 27|                                                  @LOOKUP(F18,I50..O50)
      .                    (Ø-F18*.05)
      .
      .
     ========H=========I========J========K========L========M========N========O=====
      50|Subtotal     -1000      $0     $100     $500   $1,000  $10,000  $100,000
      51|Adjustment   ERROR $10.00   $0.00   ($4.42)  ($6.64)  ($8.85)     ERROR
```

AppleWorks displays a series of # signs to indicate "data overflow". That makes it easy to identify students with failing grades.

2. Cells A55 and B55 add error-checking capability to the spreadsheet. Students' averages should never be above 100 percent. If a student's average goes above 100, the table displays the word "ERROR" in the Grade Code column.

Label Your Tables

Also note that cells A49 and B49 contain labels. The labels serve no functional purpose; no formula in the spreadsheet refers to these labels. However, the labels document your work; they help you and others recall the purpose of this strange looking table located outside the main body of your spreadsheet.

Another Example of @LOOKUP

Some companies charge processing fees for small orders and offer discounts to encourage large orders. The invoice spreadsheet in *Figure 4* uses the @LOOKUP function to determine the correct "adjustment" for an order.

The formula in cell F19 compares the total value of the order (cell F18) to the values in cells I50 through O50. If the total order is less than zero or greater than $100,000, the formula generates an error message. If the order is greater than zero, but less than $100, the formula imposes a $10 "small order fee". Orders of $100 or more but less than $500 receive no discount; orders of $500 or greater receive discounts of up to 10 %, depending on the size of the order.

Branches within Branches

Like all other AppleWorks spreadsheet functions, @CHOOSE and @LOOKUP work in combination within other functions; you can use @CHOOSE and @LOOKUP any time AppleWorks accepts a formula. You can gain even more power by combining these functions. For example, your income tax bill depends on both your taxable income and the number of dependents in your family. As a result, all powerful federal income tax templates use combinations of @CHOOSE and @LOOKUP to compute the tax you owe. For example, if cell H5 contains your number of dependents and cell G20 contains your taxable income, the formula

```
@CHOOSE(H5,@LOOKUP(G20,AA100...AA140),@LOOKUP(G20,
    AC100...AC140),@LOOKUP(G20,AE100...AE140))
```

will look up your taxes due in different tax tables, depending on the number of dependents you claim on your tax form. (Note: This formula is too large to fit within a single spreadsheet cell. We will describe how to manage large formulas in next month's spreadsheet article.)

Conclusion

The @CHOOSE and @LOOKUP functions add significant power and flexibility to the AppleWorks spreadsheet module. Taken individually, the functions are easy to learn. Your ability to use and combine these functions will enhance your ability to develop models with this AppleWorks module.

How to Use Subroutines to Simplify Macros

by Mark Munz

You can simplify complex procedures by using "subroutines" — macros that serve as building blocks in larger macros. In this article , Mr. Munz describes how to create and use subroutines.

Last month, I discussed some theoretical aspects of program flow. You learned how to write macros that "loop" to perform a single task repeatedly, and how to control those loops with variables. You learned that instead of writing a macro that says "Print, print, print, and print again", you could say, "Print four times". Loops save space and are a flexible tool with many applications.

What Is A Subroutine?

While loops make it easy to repeat the same steps numerous times, they do not serve all your needs for repetition. For example, imagine a macro that includes a short procedure you re-use often. You do not want this procedure to repeat itself, but want to re-use the series of steps from time to time throughout the macro. That is the function of a "subroutine"; a macro containing steps you can "call" repeatedly from another macro.

Subroutine macros look like any other macro, but subroutines do not stand by themselves; they provide a "service" to other macros.

A Macro within a Macro

Just as you use macros to simplify AppleWorks, macros can use other macros to simplify their work. While a keyboard macro reduces a complex series of tasks to a single keystroke, a subroutine reduces a complex series of program steps into a single token.

For example, consider the following two macros:

```
A:<awp>-subroutine-!
B:<awp><sa-a>MAIN PROGRAM<sa-a>!
```

If you compile these two macros and enter a Solid-Apple-A, you will get the message, "-subroutine-". Type a Solid-Apple-B and you will get the message "-subroutine-MAIN PROGRAM-subroutine-". When UltraMacros encounters a token that represents another macro, it transfers control to the second macro (the "subroutine macro") and then returns to the original macro to continue where it left off. In this example, macro <sa-a> is a subroutine for macro <sa-b>.

In most programming languages, a subroutine is a part of the main program. However, UltraMacros' programming language uses "subroutine macros"; completely separate macros that you call from another macro. Usually you call a subroutine macro from the main macro, but any macro can call another, so you can have subroutines call other subroutines.

A Simple Subroutine

Imagine you want to write a macro that combines the contents of two AppleWorks word processor files into a single file. The task involves (a) loading both files onto the desktop, (b) creating a file, named "Joined" to hold the concatenated version of the two files, (c) copying the contents of the first file into "Joined", and (d) copying the contents of the second file to "Joined".

Figure 1A contains a macro that performs this operation without using subroutines. The macro repeats several tasks: Using Apple-Q to select a

file, loading the files onto the desktop, and copying the text into the new file. You have to re-type those lines, so the program is unnecessarily complex.

The macros in *Figure 1B* perform the same task and demonstrate how subroutines improve the structure of a macro.

Macro <sa-c> in *Figure 1B* uses two other macros, <sa-a>, and <sa-x>. Both <sa-a> and <sa-x> use a third macro, <sa-f>. The <sa-a> macro, combined with <sa-f>, takes any file name stored in $Ø and puts that file on the AppleWorks desktop. <sa-x> uses the <sa-f> macro to locate the correct file and moves the contents of that file into the file named "BOTH".

The macros in *Figure 1B* consolidate repeated tasks into subroutines. Once you know the function of the subroutine, you can easily understand the function of the main macro.

Figure 1A: Macro That Concatenates Two Files

```
c:<all :
    oa-Q esc rtn rtn:                    {Load first file onto desktop}
    $Ø = "First" : find : rtn:
    oa-Q esc rtn rtn :
    $Ø = "Second" : find : rtn:          {Load second file onto desktop}
    oa-Q esc rtn>3<rtn rtn>Both<rtn:       {Create file to hold both}
    oa-Q : $Ø = "First" : find : rtn:     {Copy text from first file}
    oa-1 oa-C>T<oa-9 rtn :
    oa-Q $Ø = "Joined" : find : rtn :       {Copy text into new file}
    oa-1 oa-C>F<
    oa-Q $Ø = "Second" : find : rtn:     {Copy text from second file}
    oa-1 oa-C>T<oa-9 : rtn :
    oa-Q $Ø = "Joined" : find : rtn :       {Copy text into new file}
    oa-9 oa-C>F<oa-1>!              {Move to beginning of file and end}
```

Figure 1B: Macro That Uses Subroutines

```
c:<all :
    $Ø = "First" : sa-a : $Ø = "Second" : sa-a:          {Load files}
    oa-Q : esc : rtn>3<rtn rtn>Both<rtn :      {Create file for both}
    $Ø = "First" : sa-x :          {Add text from "First" into "Both"}
    $Ø = "Second" : sa-x :        {Add text from "Second" into "Both"}
    oa-1>!                              {Move to top of "Both" and end}

a:<all : oa-q : esc : rtn : rtn : sa-f!  {Add file in $Ø to desktop}

x:<all : oa-q sa-f :                        {Move to appropriate file}
    oa-1 : oa-c>T<oa-9 : rtn :                    {copy file contents}
    oa-q : $Ø = "Both" : sa-f oa-c>F!     {move contents into 'Both'}

f:<all : find : rtn!        {Select whatever file is in $Ø from list}
```

Why Use Subroutines?

Subroutines offer four advantages:

1. *Clarity*. It is easier to understand the flow of a macro; subroutines move the details out of the flow of the main program.
2. *Easier debugging*. It is easier to find errors when you "modularize" a program into subroutines.
3. *Efficiency*. Subroutines let you write shorter macros, saving space and reducing your typing.
4. *Flexibility*. Subroutines make it easier to enhance a program; you can "call" the subroutine in any additional steps you add to the macro.

Figure 1B demonstrates another advantage of subroutines: Variables established in the main macro hold their values when you call a subroutine. (In *Figure 1B*, I define the variable $Ø in the main macro, even though I don't use that value until the subroutine.)

Subroutine Limits and Features

Each time you call a macro from within another macro, UltraMacros leaves the main macro, runs the new macro, and either returns to the main macro or to another macro called by the subroutine. Thus, a macro can call a macro which calls a macro which again calls another macro ... and so on.

UltraMacros can remember up to 18 locations and can step back up the macro "path" for 18 steps, so you can repeat this process up to 18 times in a single path and write macros up to 18 levels "deep". UltraMacros always runs the subroutine macro and then returns to the correct place in the macro that called the subroutine.

Figure 2: A Macro Calls Subroutine Macros

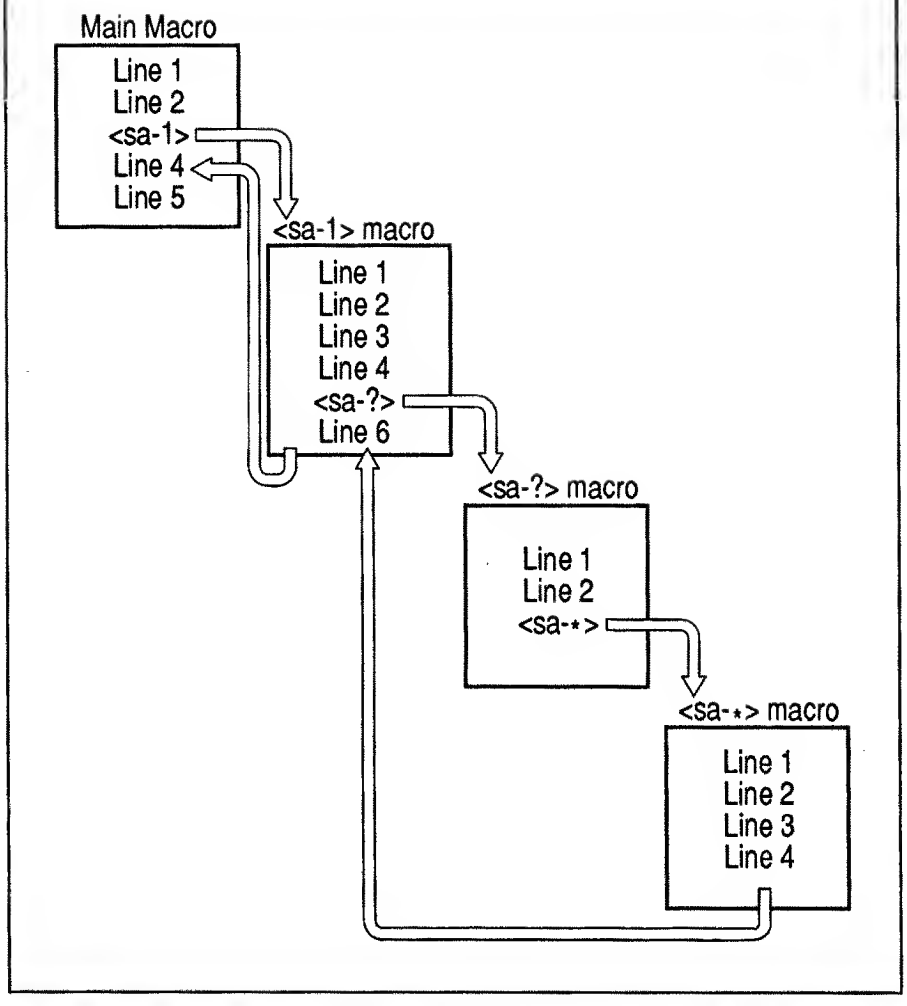


Figure 3: Using Recursion in Subroutines

Original <sa-left> Macro

```
<left>:<awp><oa-tab oa-tab oa-tab oa-tab oa-tab oa-tab oa-tab oa-
    tab oa-tab oa-tab oa-tab oa-tab oa-tab oa-tab oa-tab oa-tab oa-
    tab oa-tab oa-tab oa-tab>!
```

Revised <sa-left> Macro

```
<left>:<awp:oa-tab oa-tab:sa-left>!
```

Figure 2 depicts an example of a subroutine that is three macros deep. The main macro in *Figure 2* calls macro <sa-1> , a subroutine macro. <sa-1> calls another subroutine macro, <sa-?>, which calls <sa-*>. Control then returns to line 6 in macro <sa-1> and then back to the main macro. Line 4 in the main macro could call another subroutine macro that would start down another subroutine path; each subroutine path can be up to 18 levels deep.

Recursive Macros

Just as macros can call other macros, macros can call themselves. The macro then becomes its own subroutine. For example, consider this <sa-x> macro that prints a line of asterisks.

X:<all>*<sa-x>!

The macro prints an asterisk (*) and then calls itself. Since UltraMacros can remember up to 18 different locations, this macro prints 18 asterisks and stops.

The <sa-x> macro is a "recursive macro", a macro which calls itself. Each time the <sa-x> macro calls itself, it acts as a new subroutine. Thus, if you do not use logical statements to stop their operation, recursive macros repeat themselves 18 times and then stop.

It is rare to have recursive macros within the body of a main macro, but recursive macros make it easier to do repetitive tasks within subroutines. For example, *Figure 3* depicts the useful <sa-left> macro that is part of UltraMacros' set of default macros. This macro moves the cursor to the beginning of the line in a word processor document.

As you can see from *Figure 3*, the original <sa-left> macro consists of many <oa-tab> commands. *Figure 3* shows how you can use a recursive macro to perform the same task. The revised macro sends 36 <oa-tab> commands to AppleWorks; two <oa-tab> commands per subroutine multiplied by the 18 times a macro can call itself.

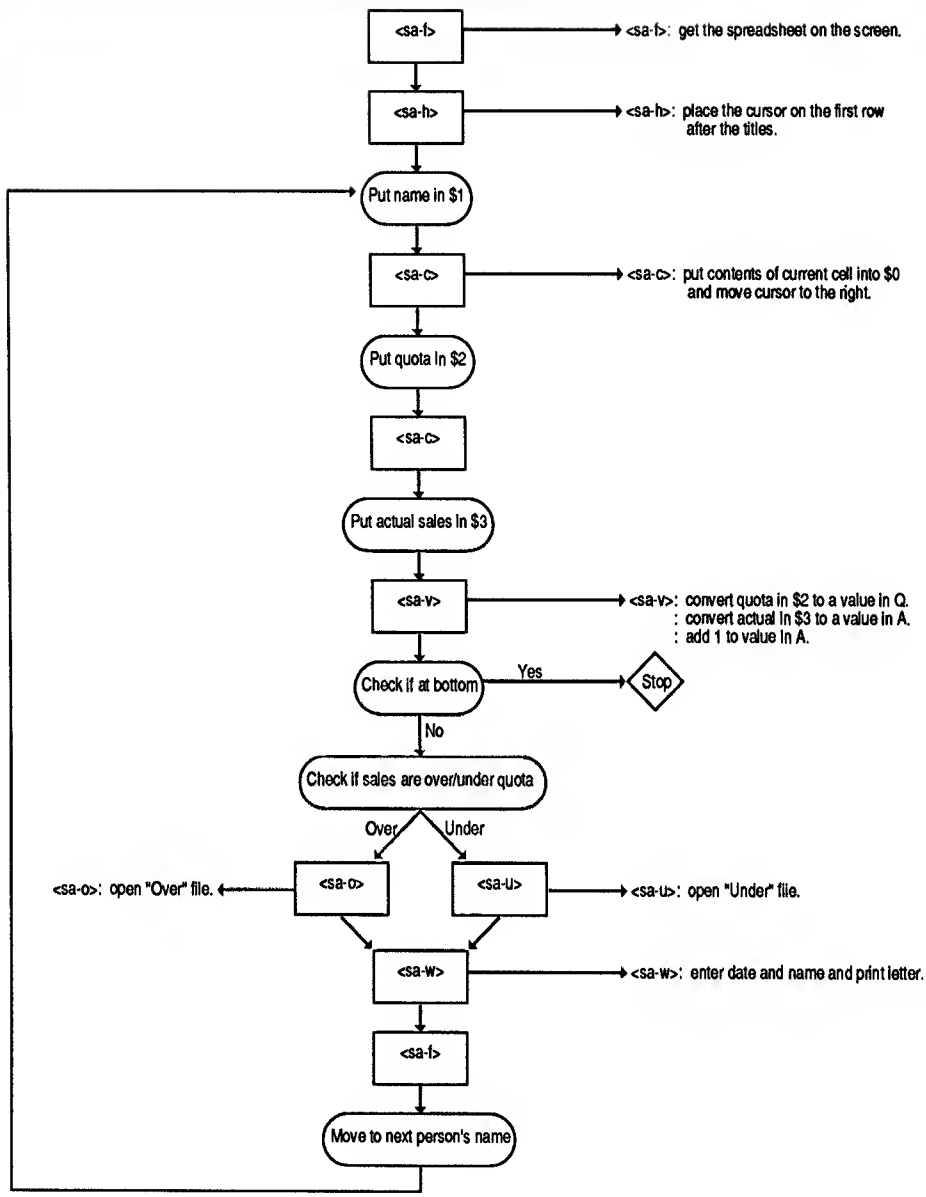
It is apparent that you can use subroutines to make your macros more efficient and understandable.

An Application

Figures 4 through *8* depict a practical application of subroutine macros. This application analyzes a spreadsheet that compares each sales representative's actual sales with his or her quota of expected sales. The macro prints a congratulatory letter to employees who meet or exceed their quotas and encouraging letters to the employees who fall short of their quota.

Figure 4 depicts the operation of this application, and *Figure 5* presents the main macro and subroutine macros. *Figures 6* through *8* present the spreadsheet and word processor files you must create and load onto the AppleWorks desktop before you can run this macro.

Figure 4: Application That Generates Letters



How Subroutines Work in the Macro

To understand a macro, you must first to try to picture the overall goal of the macro. In this case, the goal is to compare sales data with quotas in a spreadsheet and generate short memos to people who are above or below their quota.

Start at the top of the main macro and try to understand each step. Follow the macro when it sends you to a subroutine and try to understand the purpose of each subroutine. The subroutines are the short macros that follow the <sa-m> macro in *Figure 5*. Here is the function of each subroutine in this macro:

<sa-f>	Switches to the main spreadsheet file from anywhere in AppleWorks.
<sa-h>	Moves to the top of any spreadsheet file.
<sa-c>	Reads the value of a cell into $Ø and moves the highlight one cell right.
<sa-o>	Moves to the word processor file used for representatives meeting or exceeding their quota.
<sa-u>	Moves to the word processor file for representatives under their quota.

Figure 5: Report Generator Macro

```
M:<all:sa-f:                              { put spreadsheet on screen }
   sa-h:                                  { put cursor on first name }
   begin                                        { start loop here }
   sa-c:                        { capture current cell in variable $Ø }
   $1=$Ø :                                { Put name into variable $1 }
   sa-c: $2=$Ø                            { put quota in variable $2 }
   sa-c: $3=$Ø                            { put actual in variable $3 }
   sa-v:                      { convert $2 and $3 into values Q and A }
   if $1 = "-------------" then oa-1:stop:elseoff:{ Stop if end }
   if A < Q then sa-U : sa-W : elseoff : { Print "Under" letter }
   if F > Q then sa-O : sa-W : elseoff : { Print "Over" letter }
   sa-f:                                  { go back into spreadsheet }
   oa-left:down:                { back to left side ... next person }
   rpt>!                                          { repeat loop }

F:<all:oa-Q:                                  { call up Desktop Index }
   $Ø="Sales Summary":find:rtn>! { search for Spreadsheet file }

H:<asp:oa-f>c<oa-Y>A1<rtn:                          { top of file }
   down:down>!                                  { Skip title info }

C:<asp:cell:right>!          { get current cell contents into $Ø }
                                { and move cursor to the right }
O:<all:oa-Q:                                  { call up Desktop Index }
   $Ø="Over":find:rtn>!                        { search for Over file }

U:<all:oa-Q:                                  { call up Desktop Index }
   $Ø="Under":find:rtn>!                       { search for Under file }

V:<all:Q = val $2 :                                      {Q = Quota}
   A = val $3 :                                        {A = Actual}
   F = A + 1>!                                {F = Adjusted Actual}

W:<awp:oa-1:insert                                  { goto first line }
    rtn>DATE:<tab:date:rtn:                           { enter header }
    rtn>TO:<tab:print $1:rtn:rtn:
    oa-P:rtn:rtn:rtn:                                 { print letter }
    up:oa-D:oa-1:rtn>!                               { delete header }
```

<sa-v> Converts text read from spreadsheet cells into numeric values.

<sa-w> Places header information at the top of whatever document is current, prints the document, then deletes the header.

Make certain you always understand an operation before you proceed to the next instruction.

How the Macro Works

The user enters a Solid-Apple-M to start the main macro; the <sa-m> macro controls the entire process and calls all the necessary subroutines. Study *Figures 4* and *5* carefully until you can understand the operation of this series of macros.

Figure 6:Sales Summary

```
File: Sales Summary              REVIEW/ADD/CHANGE
============A============B========C========D=
  1|Salesperson            Quota    Actual
  2|-------------          -----    ------
  3|Larry Davis              400       301
  4|Cherri Dawson            150        54
  5|Elaine Grant             250       312
  6|Richard Huber            325       397
  7|Darel Jevins             400       408
        :                              :          :
        :                              :          :
        :                              :          :
 13|TOTALS                   2900      2988
```

Figure 7: Sales Over Quota

```
File: Over                             REVIEW/ADD/CHANGE
====|===|===|===|====|====|====|====|====|====|=====|
From:     Terry Wilson, area manager

You met your ambitious sales quota for the past three
months; I congratulate you on your fine achievement.
It is difficult to achieve these goals and I hope you
can continue your exceptional performance.

Sincerely,
ACME Widgets, Inc.
```

Figure 8: Sales Under Quota

```
File: Under                            REVIEW/ADD/CHANGE
====|===|===|====|====|====|====|====|====|====|====|
From:     Terry Wilson, area manager

I am certain you were disappointed not to meet your
sales goals for the past quarter. From my observa-
tions, I believe you are a dedicated member of the
company and are working hard to contribute to our
effort. Please let me know if there is any way I can
help you achieve your goals.

Sincerely,
ACME Widgets, Inc.
```

Other Applications

This application can serve as a model for many similar macros. For example, you could modify these macros to generate progress reports for students in a class or to generate different letters depending on whether a bill was 30, 60, or 90 days overdue.

Conclusion

This month, I described how to use subroutine macros to improve your macros. Looping and subroutines let you write macros that perform repeated tasks efficiently. Use loops when you want to perform a repetitive operation one time after another; for example, to write a macro that repeats the Find Command until it finds a special character. Use subroutines when you need to perform a task often, but in different parts of the macro.

Subroutines let you write more efficient, understandable, and powerful macros.

Next month, I will describe how to make full use of UltraMacros' important <if-then-else> statement.

[Mark Munz is a programmer on the staff at Beagle Bros, publishers of TimeOut UltraMacros.]

A Perfect Marriage With

. . . AppleWorks®

CHECK IT OUT

A CURE FOR BILL PAYING HEADACHES . . . Inside AppleWorks a check like interface permits entry of data plus financial and tax reporting. It prints any type personal, business or Quicken checks. Alpha Check loads through its own menu or Beagle Bros. timeOut system (Read about us in the May inCider).

Runs inside **AppleWorks®** 2.0, 2.1

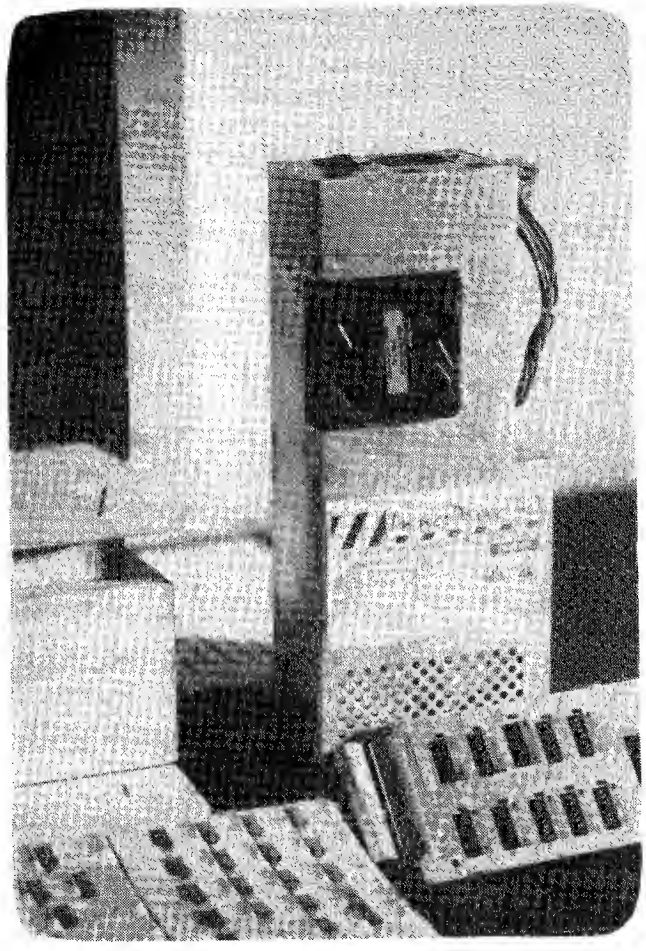
Only **$39.95**

Plus $3.50 Shipping and handling

ACTAsoft

(818) 996-6731 or (818) 786-9760

19700 Wells Dr., Woodland Hills, CA 91364



AppleWorksGS in 15 Sec, All modules.

Using GS/OS 5.0 andVersion 2 of AppleWorksGS. It only takes 50 seconds to load all modules using GS/OS 4.0. Talk about an increase in productivity, when it takes about 7 minutes to load all modules from a 3.5" floppy drive! The internal hard drive for the IIgs was innovated by Applied Ingenuity, not only because we know that you don't have a lot of desktop space, but we also know that you don't want to spend a lot of time searching for your programs and data on your floppy disks and then to wait for them to load from the disk drive. InnerDrive is the fastest, most affordable, and only internal hard disk for your IIgs. A IIe version is also available. Others are scrambling to play a game of catch up, while InnerDrive has proven itself for the past year, to be of high quality and reliability. Using the standard operating system Inner Drive is 100% compatible with ProDos and GS/OS. InnerDrive comes formatted, with the operating system installed, the controller card and all cables, ready to just pop in within about 5 minutes, and a bonus 3 megabytes of programs FREE!

Applied Ingenuity, Inc.

14922M Ramona Blvd, Baldwin Park, CA 91706

CALL TOLL FREE: **800-346-0811**, or in CA:**818-960-1485**

20 meg. $499, 30 Meg $599, 40 meg $699

Just by mentioning this AD get free Shipping within the US

all prices subject to change without notice

How to Manage Your Hard Disk

by Gary R. Morrison

The previous articles in this series describe how to select and install a hard disk drive on your Apple II computer. This month, Dr. Morrison describes programs that manage your disk and how to name files you store on the disk.

Your hard disk is like a business; it needs a good management plan to function efficiently. In this article, I will describe the skills you need to manage your hard disk drive. By the end of this article you should understand filenames, pathnames, and prefixes. In addition, you should know how to install a disk management program on your hard disk drive.

Figure 1: Correct and Incorrect Filenames

Filename	Comment
HOME	Correct
home.ba	Correct
ACCOUNT.1	Correct
ACCOUNT 1	Incorrect. Spaces not allowed in filenames.
1ACCOUNT	Incorrect. All filenames must start with a letter.
ACCOUNT.MAY.JUNE.89	Incorrect. Name is longer than 15 characters.

ProDOS Filenames

Last month you installed an operating system on your hard disk. Apple IIe and IIc owners installed ProDOS 8, Apple IIGS owners installed GS/OS. You also divided each volume on your hard disk into directories and subdirectories. Now, some additional background will help you manage the files you store in the subdirectories on your disk.

You must follow certain conventions when you name files on your disk. Fortunately, both ProDOS and GS/OS follow the same conventions, and these rules apply to every file on your disk, including program files, data files, and ASCII or DIF files.

Here are the rules for assigning names to files:

1. Every filename must begin with a letter.
2. All other characters can be either letters, numbers, or periods. You cannot use symbols, punctuation marks other than a period, or spaces in a filename. (Note that you can enter spaces within a filename in AppleWorks, but AppleWorks replaces each space with a period when it saves your file, thus the file "NEW DATA" becomes "NEW.DATA" on your disk. AppleWorks deletes the period when it displays the filename.)
3. Filenames can be up to 15 characters long.

Figure 1 includes examples of correct and incorrect ProDOS filenames.

You should try to assign meaningful names to your files, but that can be difficult with the 15-character limit imposed by ProDOS and GS/OS, so you should use meaningful abbreviations you can remember.

Pathnames

As you know from last month's article, you should subdivide your hard disk into different segments called "subdirectories". These subdirectories make it easier to find a file on the disk.

Figure 2 depicts the subdirectory structure of a disk called "DATA". I established two main subdirectories called "BUS1" and "HOME". I further subdivided the BUS1 subdirectory into two subdi-

rectories, called "SULLIVAN" and "OWENS". Then I further subdivided the "SULLIVAN" subdirectory into two subdirectories called "ACCT" (for "accounting") and "TAXES". Finally, I saved two files called "MAY" and "JUNE" in the "ACCT" subdirectory and two files called "Y88" and "Y89" in the "TAXES" subdirectory.

When I want the file "JUNE", I must tell AppleWorks the "path" to that file. Pathnames are like directions. Suppose someone asks you for directions to the post office. You might reply "Go down Main Street to Elm, turn left on Elm, continue to Second Avenue, and make the first right." You described the "path" to the post office.

Similarly, ProDOS and GS/OS use pathnames to locate the files stored in different subdirectories on the disk.

A pathname begins with the volume name and includes all the subdirectories between the volume name and the file. For example, in *Figure 2*, the pathname to the June accounts file is /DATA/BUS1/SULLIVAN/ACCT/JUNE.

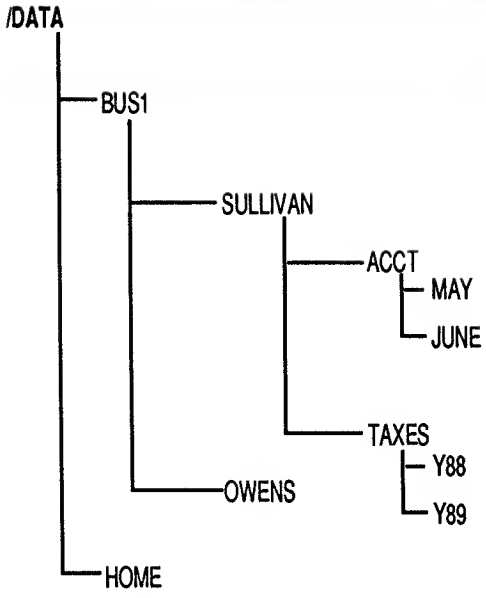
There are three rules for pathnames:

1. They must begin with a slash and the volume name.
2. You must separate each segment of the pathname with another slash.
3. ProDos accepts pathnames up to 64 characters-long, but AppleWorks only lets you enter up to 48 characters in a pathname. (You can see the importance of using short names for your subdirectories and files. If you use long names you might not be able to access the files in a subdirectory.)

Prefixes

A prefix is a pathname that consists of the names of the subdirectories leading to a file, but not the name of the file itself. For example, the prefix for the spreadsheet named "JUNE" in *Figure 2* is /DATA/BUS1/SULLIVAN/ACCT. By specifying this prefix, you can access the files in the ACCT directory by entering only the filename, you do not have to enter the complete pathname to the file.

Figure 2: Hard Disk Subdirectory



Summary

Remember, all filenames and subdirectory names must follow the rules for ProDOS and GS/OS filenames. A pathname includes the complete route to the file, including the filename. A prefix lets you specify the path to all the files in a specific directory. We will use these concepts later as we set up our hard disk.

Hard Disk Management Software

If you followed the steps I outlined in previous articles in this series, you formatted your disk and installed either ProDOS 8 or GS/OS. The next step is to install disk management software on the hard disk.

But why do you need disk management software?

One advantage of floppy disks is that they are easy to manage. You rarely need to subdivide your files into subdirectories, so you usually don't deal with pathnames and prefixes. In addition, you generally keep each program on a different disk, so all you do to change programs is to insert the correct disk in the drive and boot your computer.

Things are different with a hard disk, where you put your programs in different directories on a single large storage device. Then you "launch" (or start)

your programs with the GS/OS Finder or with ProDOS commands.

The popularity of hard disks and the difficulty of keeping track of the files on those disks spawned a new genre of software, called "disk management packages". These programs help you structure and locate the files on your hard disk drive. Disk management packages include:

Program selectors that let you launch different programs from your hard drive without the need to enter pathnames and ProDOS commands.

Management utilities that let you copy files to and from your hard disk, delete files, rename files, create subdirectories, and backup and restore files on your hard disk system.

The three most common disk management programs are the Finder, EasyDrive, and ProSel. You can use EasyDrive and ProSel with any Apple II computer; the Finder only works on the Apple IIGS.

Using the Finder

The Finder is a part of GS/OS; you installed the Finder when you installed GS/OS on your hard disk.

The Finder is a visual, mouse-driven disk management program that uses Apple's desktop metaphor. You use the mouse to move a pointer to an icon and double-click the mouse on the icon you want to "open". For example, to execute AppleWorks, you double-click on the appropriate icons until the file APLWORKS.SYSTEM appears on your screen, then you double-click on the APLWORKS.SYSTEM icon. (The easiest way to learn to use the Finder is from the first 93 pages of the Apple IIGS System Disk User's Guide that came with your computer.)

The Finder has three advantages over other disk management programs: (a) it is graphically based and easy to learn, (b) it is free, and (c) you do not have to install the Finder; it automatically appears on your desktop when you install GS/OS. Unfortunately, the Finder is slow and lacks some important features built into the other disk management programs. While many IIGS owners use the Finder, I recommend you install either EasyDrive or ProSel to manage your hard disk. EasyDrive and ProSel are fast, inexpensive, menu-driven programs with easy-to-use program selectors and powerful disk management utilities.

How to Install EasyDrive

Follow these steps to install EasyDrive:

Apple IIe or IIc:

1. Boot your computer from the hard disk. That leaves you with the BASIC prompt on the screen.
2. Put the EasyDrive disk in Drive 1, type PR#6, and press the Return Key.
3. Press the Escape Key when the EasyDrive Main Menu appears on the screen.
4. Use the Arrow Keys or mouse to select "Install" on the top menu bar and press the Return Key. That will display the installation screen.
5. The installation program displays a list of volumes currently on-line and asks where you want to install EasyDrive. If you used the volume names recommended in this series of articles, use the Up Arrow and Down Arrow keys to highlight the volume named PROGRAMS and press the Return Key.
6. The next question asks which operating system to install. You already installed your operating system, so select "None".

EasyDrive will install itself and all its utility programs. Installation is complete when you see the EasyDrive Main Menu.

Apple IIGS:

1. Boot your computer; the Finder desktop appears on the screen.
2. Insert the EasyDrive program disk in a disk drive and double-click on the drive icon to display the contents of the disk.
3. Double-click on the file EZINS.SYSTEM to display the EasyDrive Installation Menu.

Now continue with steps 5 and 6 in the Apple IIe/IIc directions above.

How to Install ProSel

There are two versions of ProSel: ProSel-8 and ProSel-16. While you can use either version of

ProSel with AppleWorks, I suggest you use ProSel-8 if you installed ProDOS and ProSel-16 if you installed GS/OS on your hard disk.

Follow these steps to install ProSel:

Apple IIe or IIc:

1. Boot the computer from the hard disk.
2. Insert the ProSel program disk in Drive 1.
3. Enter the command "PREFIX UTIL" and press the Return Key.
4. Enter "-INSTALL.PROSEL" and press the Return Key.
5. ProSel asks for the name of the volume where you want to install ProSel. If you followed our recommendations last month, enter "/PROGRAMS". (Remember to type the slash before PROGRAMS.)
6. Select "Full Installation" from the menu choices.

ProSel will install itself on your hard disk and display the ProSel Main Menu. Now you should select the option that prints the ProSel documentation. ProSel includes a powerful set of utility programs; you will want the documentation so you can use the utility programs on the disk.

ProSel-16 on an Apple IIGS:

1. Boot the computer from the hard disk. Wait until you see the Finder desktop.
2. Put the ProSel-16 disk in a drive and double-click on the icon for that drive. That will display a list of the files on the ProSel disk.
3. Double-click on the SYSTEM folder on the ProSel disk.
4. Double-click on the START file within the SYSTEM folder. You will see the ProSel-16 Main Menu.
5. Enter a "G" and press the Return Key.

ProSel will install itself on your hard drive and will display its Main Menu. Select the choice that prints the documentation.

ProSel-8 on an Apple IIGS:

AppleWorks and all AppleWorks-compatible enhancements, are 8-bit programs that do not use the 16-bit operating system built into GS/OS. So many AppleWorks users install ProSel-8 on their Apple IIGS computers. While I recommend that you install ProSel-16 on your IIGS, follow these steps if you want to install ProSel-8 on your system:

1. Boot your computer from the hard disk and wait for the Finder desktop to appear.
2. Put the ProSel disk in a drive and double-click on the icon for that drive.
3. Double-click on the folder labelled "UTIL".
4. Scroll through the list of files in the folder UTIL until you find the file "INSTALL.PROSEL", then double-click on that file.
5. ProSel asks for the name of the volume where you want to install ProSel. Enter "/PROGRAMS". (Remember to type the slash before PROGRAMS.)
6. Select "Full Installation" from the menu choices.

Summary

In this article I explained pathnames, filenames, and prefixes. I also described how to install two popular disk management programs, EasyDrive and ProSel, which make it easier to use your hard disk.

New month I will describe how to install and modify AppleWorks and other applications to run on your hard disk system.

[EasyDrive, version 1.5, costs $69.95 from Quality Computers, 15102 Charlevoix, Grosse Pointe, Michigan 48230 ((800) 443-6697).

ProSel-8, version 4.0, and ProSel-16, version 7.1, cost $40 each from Glen Bredon, 521 State Road, Princeton, New Jersey 08540. You can upgrade from ProSel-8 to ProSel-16 for $20]

[Dr. Gary R. Morrison is an Associate Professor at Memphis State University. He is the author of the book "ProDOS 8 and 16", RepairWorks, and numerous other articles and software.]

How to Get Help with AppleWorks-Compatible Software

by Nanette Luoma

Each month, the ***AppleWorks Forum*** lists the member-volunteers who offer technical support for AppleWorks products. This month's list identifies the volunteers who can answer questions about AppleWorks-compatible software. Next month's issue will contain a list of members who offer help with applications of AppleWorks and Apple IIGS-specific questions.

Software Add-Ons

How to Use This List

Use this month's list to find help with Beagle Bros and Pinpoint enhancements. To the left of each volunteer's name is one or more numbers indicating the enhancements that consultant supports. Volunteers are listed alphabetically by state.

1 = 1040Works	6 = ReportWorks
2 = AutoWorks	7 = RAMUP
3 = GraphWorks	8 = SchoolWorks
4 = ThinkWorks	9 = Sensible Grammar
5 = MegaWorks	10 = Sensible Speller

		City	Home	Work
Alabama				
2	Rebecca Cathey	Eutaw	205/ 372-3581	
Alaska				
1,2	Ross Lambert	Unalakleet		907/ 624-3161
California				
2	Michael Beebe	San Diego	619/ 224-8823	619/ 221-2363
1,2	Robert Demmon	Coronado	619/ 435-0554	619/ 435-0520
2	Donna Ewing	Costa Mesa		714/ 556-3169
2	Berenice Maltby	Corone del Mar	714/ 640-7369	
Colorado				
1,2	Gary Armour	Littleton	303/ 933-9493	
1	Lyle Graff	Littleton	303/ 794-5970	303/ 977-4557
2	Carol McPeek	LaSalle		303/ 284-5508
Connecticut				
1,2	Martin Knight	Middletown	203/ 346-9698	
Florida				
2	John Andrianoff	Ft. Pierce		305/ 466-6653
Georgia				
1,2,3	Jim Sulsone	Doraville	404/ 455-0853	
Illinois				
1	J. Terry Flynn	Lake Bluff	312/ 234-2820	312/ 680-0980
2	Connie Peters	Decatur	217/ 429-6242	217/ 875-2431
2	Dennis Ricke	St. Charles	312/ 377-4829	312/ 377-4829
2	Walter Schillinger	Oak Park	312/ 386-2278	312/ 451-3000
Indiana				
2	Stanley Boler	Knightstown	317/ 345-5663	
1,2	Brenda Crenshaw	Shelbyville	317/ 398-0525	317/ 264-1286
2	Irvin Haas	Carmel	317/ 848-0050	
Iowa				
1	Den York	Marion	319/ 373-1883	319/ 373-2083
Kansas				
2	Dick Fogliasso	Girard	316/ 724-4590	316/ 724-4330
2	Marcia Philbrick	Seneca	913/ 336-3645	913/ 336-3557
Maryland				
2	Ron Jecobs	Laurel	301/ 498-0558	301/ 725-3228
1	David Ottalini	Silver Springs	301/ 681-5792	
2,3	Ronald Romanowicz	Glencoe	301/ 472-2983	301/ 472-4800
2	Michael Spurrier	Baltimore	301/ 298-0263	301/ 955-5938
Michigan				
2	Dawn Andrews	Muskegon	616/ 755-4308	
2	Jim Anker	Hazel Park	313/ 391-0030	313/ 542-3910
1	Joe Connelly	Livonia	313/ 421-8729	
2	Arthur Deniel	Warren	313/ 445-7105	313/ 445-7142
2	Jane Harris	Grand Rapids	616/ 458-2653	
2,3	Pete Ross	Wayne	313/ 728-8720	
2	Brian Theil	Teylor	313/ 287-4608	
1	Richard Zajec	Mt. Clemens	313/ 465-2615	313/ 465-5040
1,2,3	Keith Zook	Grosse Ile		313/ 675-1550
Minnesota				
1,2	James Hirsch	Coon Repids	612/ 421-8393	612/ 422-5572

		City	Home	Work
Mississippi				
2	Bill Brescia	Union	601/ 656-5251	601/ 774-5609
Missouri				
1	Whit Crowley	Manchester	314/ 394-7955	
2	Lynn Leopard	Chillicothe	816/ 646-4196	816/ 646-0702
Montana				
1,3	Steve Bernbaum	Sheperd	406/ 373-6393	
2	Bob Shipek	Great Falls	406/ 452-9104	406/ 791-2130
Nebraska				
1,2,3	Larry B. McEwen	Hastings	402/ 463-2267	402/ 463-1387
New Hampshire				
2	Chris MacLeod	Concord	603/ 224-0520	
New Jersey				
2	Pete Crosta	Nutley	201/ 667-6369	201/ 677-4050
1	Edwin C. Doe	Pt. Pleasant	201/ 528-6349	
1	Matthew Jones	Neptune	201/ 774-0983	
2	Link Keur	Augusta	201/ 875-2568	201/ 992-7000
2	Linda Nixon	Chatham	201/ 635-0973	
New York				
2	Bob Beer	Coram	516/ 928-6870	
2	Michael Bice	Garden City		516/ 741-7800
2	Cynthia Gillmore	Johnstown	518/ 762-8483	518/ 725-4016
2	Sister Mary Gregory	Watertown	315/ 782-3460	315/ 788-4670
1,2	Don Menges	Rochester	716/ 544-9398	
1,2	Betty M. Minemier	Dansville	716/ 335-6258	716/ 335-3186
2	James Nicoll	Pittsford	716/ 381-9480	716/ 546-6732
1,2,3	Jerry Taylor	Hilton	716/ 964-3319	716/ 964-3587
1	Walter Taylor	W. Henrietta	716/ 359-2857	716/ 263-7700
North Carolina				
2	Terry W. Robertson	Charlotte	704/ 536-4261	704/ 377-0111
Ohio				
2	Mark Ball	Paris	216/ 862-3277	216/ 627-7606
3	Jessie Beale-Hansen	Cinti	513/ 751-6834	513/ 241-6400
1,2	William Beasley	N. Olmsted	216/ 933-4408	216/ 777-7700
1	Mark Elliot	Hudson	216/ 653-5006	216/ 686-2280
1,2,3	Guy R. Moore	Oxford	513/ 523-3797	513/ 529-7584
1,2	Howard Moskowitz	Toledo	419/ 535-8647	419/ 729-8412
2	Bill Ries	Cincinnati	513/ 941-7933	513/ 941-7831
1,2	Patricia Ritchey	Bowling Green	419/ 673-0040	419/ 372-7038
Oregon				
2,3	Jim Emig	Portland	503/ 771-1916	503/ 280-5666
2	David Chesebrough	Sewickley	412/ 241-5129	
1,2	Martin Friedman	Philadelphia	215/ 473-6137	
2	Don Pratt	Bloomsburg		717/ 389-4639
South Carolina				
2	Oliver Roosevelt	Fairforest	803/ 574-1104	803/ 576-1270
2	Charlotte White	Union	803/ 427-1389	
Texas				
2	Martha (Polly) Davis	Baytown	713/ 422-7560	
1	Joseph Kline	Lubbock	806/ 796-0829	
1,2	Ralph Logan, Jr.	Fort Worth		817/ 281-0661
Vermont				
2	Lars Baris	Essex Jct.		802/ 878-1392
Virginia				
1,2	Warren Downes	Yorktown	804/ 898-1881	804/ 898-8386
2	Tiny Laster	Hampton	804/ 766-3969	
1	William W. Sanderson	Merrifield	703/ 352-1568	703/ 820-8550
Washington				
2	Gary Cressman	Enumclaw	206/ 825-6909	
2	Nancy Langlow	Redmond	206/ 868-7254	206/ 455-6052
Wisconsin				
2	Peter Lee	Milwaukee	414/ 344-6807	414/ 963-6180

Electronic Index Disk Update

The list to the right contains the July 1989 update for NAUG's Electronic Index Disk. If you have more than 128K of RAM, enter the data into the file "Forum Index.All". If you have a 128K system, enter the data into the file "Forum Index.III".

NAUG updates the Electronic Index Disk monthly. You can order the latest version from the NAUG Public Domain Library ($4 per disk; $2 postage per order) or download the latest version of the file from the NAUG bulletin board, (313) 482-8090, or the NAUG area on CompuServe.

Electronic Index Disk July 1989 Update
Enter the default values for these categories: Volume #: 4 • Issue #:7 • Date: Jul 89
Enter the rest of the data in the following order: TYPE • PAGE • TITLE • AUTHOR • KEY WORDS

Editorial • 2 • Claris Releases AppleWorks 3.0 • n/a • AppleWorks; Claris; upgrade

AppleWorks News • 3 • AppleWorks 3.0: A Major Upgrade • Williams, Warren • AppleWorks; Claris; upgrade

AppleWorks News • 5 • A History of AppleWorks 3.0 • Merritt, Cathleen • AppleWorks; Claris; upgrade

AppleWorks News • 6 • Limits and Capacities of AppleWorks 3.0 • Williams, Warren • AppleWorks; upgrade; spreadsheets; data bases; word processors

AppleWorks News • 7 • How to Upgrade to AppleWorks 3.0 • n/a • AppleWorks; Claris; upgrade; special offers

AppleWorks News • 8 • New Spreadsheet Functions in AppleWorks 3.0 • Williams, Warren • AppleWorks; upgrade; spreadsheets; commands

AppleWorks News • 9 • Printers Supported by AppleWorks 3.0 • Williams, Warren • AppleWorks; printers; Brother; Epson; Imagewriter; Juki; Okidata; Panasonic; Qume; Scribe

AppleWorks Add-Ons • 11 • What You Should Know about Enhancing AppleWorks 3.0 • Merritt, Cathleen; Smith, James • Applied Engineering; Beagle Bros; Checkmate; JEM Software; TimeOut

AppleWorks News • 14 • AppleWorks 3.0: My Favorite Features • Brandt, Randy • AppleWorks; data bases; spreadsheets; upgrades; word processors

AppleWorks News • 15 • Some Interesting Background on AppleWorks 3.0 • Brandt, Randy • AppleWorks; Claris; upgrade

Spreadsheet Tip • 16 • Branching Spreadsheets: How to use @LOOKUP • Williams, Warren; Merritt, Cathleen • spreadsheet; @LOOKUP

Macro Primer • 20 • How to Use Subroutines to Simplify Macros • Munz, Mark • macros; UltraMacros

Hard Disk Primer • 26 • How to Manage Your Hard Disk • Dr. Gary R. Morrison • hard disk drives; hardware; GS/OS; ProSel; EasyDrive; Finder

Members Helping Members • 30 • How to Get Help with AppleWorks Compatible Software • Luoma, Nanette • special programs; Members Helping Members; software

New Key Words: ProSel; EasyDrive; Finder

AppleWorks Forum

NAUG
National AppleWorks Users Group
Box 87453, Canton, Michigan 48187
(313) 454-1115
BBS (313) 482-8090

NAUG Membership

Name _____

Member Nº, if renewing _____

Address _____

_____

City _____ State _____

Zip _____ Country _____

Home Phone _____

Work Phone _____

Circle all which apply:

	One Year	Two* Years
The *AppleWorks Forum* *(12 monthly issues; includes 2nd Class postage to United States, Canada, and Mexico)*	$27	$54
Special Postage Options *(Select postage option and add to Membership Fee, above)*		
1st Class Mail to U.S. and Mexico	$15	$30
1st Class Mail to Canada	$20	$40
Surface Mail outside North America	$12	$24
Air Mail outside North America	$35	$70

Total Enclosed $_____

☐ Check Enclosed ☐ MasterCard ☐ VISA

Credit Card Account # _____

Expiration Date _____

Signature _____

** Avoids future price increases*

NAUG shares members' addresses with other users groups and selected vendors. If you do not want to receive mail from these agencies, check here: ☐

AppleWorks is a trademark of Apple Computer, under license to Claris Corporation.

Classified Advertising

NAUG accepts classified advertisements in the *AppleWorks Forum*. These advertisements must meet the following criteria:

1. The individual's or company's name, address, and telephone number must be included in the advertisement.
2. The classified section is for text-only advertisements. No art or special type effects may be used.
3. Payment must accompany your order. Orders must be received at least 45 days before the cover date of the issue in which the advertisement will appear.

Rate: 50¢ per word per issue.

Seminar Schedule

NAUG sponsors AppleWorks seminars in various locations throughout the country. These seminars, entitled "AppleWorks: Beyond the Basics", are intended for AppleWorks users who want to solve AppleWorks problems and learn new techniques.

Seminar schedule:

August 1 — Seattle, WA
August 8 — Portland, OR
August 10 — Denver, CO

The presenter, Dr. Warren Williams, is a technical advisor to NAUG and a frequent contributor to the *AppleWorks Forum*. He has written more than 60 articles about AppleWorks and has conducted more than 75 AppleWorks seminars throughout the country. Write or call NAUG for more information.

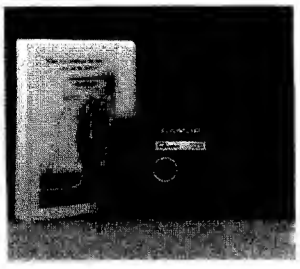
ULTIMATE APPLE ENHANCEMENTS

We have it all!

If you don't see it in this ad, call!!

ULTIMATE ENHANCEMENT SOFTWARE

RAMUP 4.0



RAMUP 4.0
Utility software that automatically combines all your ProDOS programs onto an Apple-compatible Ramcard to make them work as one. You just flip from program to program at will — like turning a page.

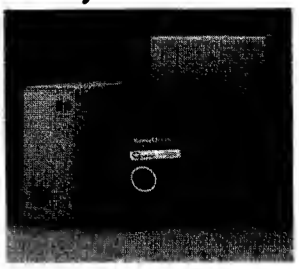
Special features include:
- Autoload
- Unidisk and Hard-Disk compatibility
- Back Up and Restore
- Statistical displays

$39.95

EasyDrive
The first and only complete interface for the hard-disk. Nothing is faster or easier. For smooth, trouble-free operation, EasyDrive is a must.
- Automatic installation
- Back Up and Restore
- Caching
- Mouse Control
- Automatic loading
- Statistical Displays
- Optimizing
- ProDOS Book

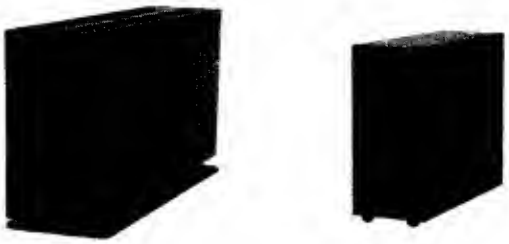
$69.95

EasyDrive 1.5



Match wits with speed and storage. Find out about the RAMUP/ EasyDrive Combo — $94.95.

ULTIMATE HARDWARE



$349

CMS HARD-DISKS
Reliable, Mac-compatible drives have multi-user capability. Includes: auto parking, SCSI and internal fan. 20, 40 and 60 meg.

SIDER HARD-DISKS
Four years as top selling brand. Includes: multiple operating system (D2). 20, 40 and 90 meg. 60 meg. tape back up available separately or included in some units.

CHINOOK HARD-DISKS
Compact, reliable drives, Includes: auto parking, SCSI, and are Mac-compatible. Comes in 20, 30 and 40 meg. plus a 20 meg. model for the IIc and IIe.

APPLIED ENGINEERING RAMCARDS. The industry standard. Quality Computers is one of the largest distributors of Applied Engineering products in the country. All AE products come with a five year warranty.

Free introductory copy of Easy Drive with each hard drive purchase.

ULTIMATE PRICES

AE APPLIED ENGINEERING

Transwarp	149	Sonic Blaster	99
RamKeeper	139	5½ Drive	119
RamCharger	133	ViewMaster	119
Serial Pro	114	PC Transporter	519
Data Link	179	RamWorks III	Call
Phasor	139	RamFactor	Call
Parallel Pro	89	GS Ram	Call
Time Master	76	GS Ram +	Call
Power Supply	59	Z Ram I, II, III	Call

Transwarp GS. . . . . call

PRICES SUBJECT TO CHANGE

CMS

20 Meg. SD	629
30 Meg. SD	699
40 Meg. SD	769
60 Meg. SD	839

Ask for your free catalog "APPLE II Review"

Sider

D2	499
D4a	639
D4T	849
D9	1451
C96	2145
T6	729

CHINOOK

CT20	629
CT30	729
CT40	839
CT20C for IIc	675

MISCELLANEOUS

Sys. Save IIe, GS	59,69
Thunderscan	175
5.25 double sided drive	
Timeout series	call
Rocket Chip 5mgz	call
Apple SCSI REV C	

ULTIMATE SERVICES

To complete this "ultimate picture," we have filled our staff with real professionals. Our sales people, technical consultants, and shipping department work together to satisfy all your needs. Your orders are processed and shipped quickly. Your questions are answered completely, and in terms you can understand.

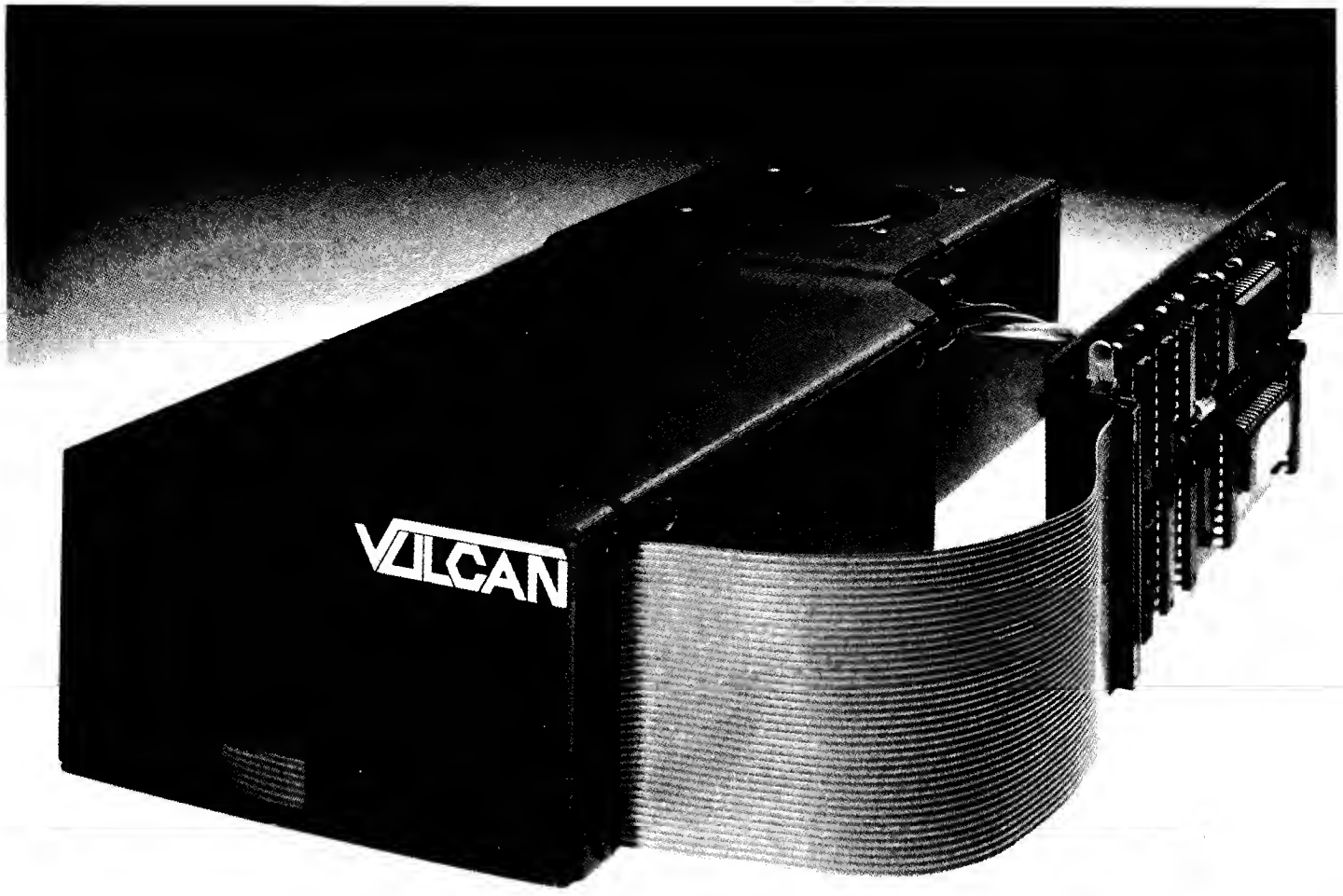
Items ordered in error are subject to a 15% restocking fee.

ATTENTION HARD-DISK BUYERS. Ask about hard-disk set ups. We'll format and configure your hard-disk for a price you just can't beat. Also, prevent extended down time with our hard-disk insurance plan. You'll never be without the power and convenience of your hard-disk. Call for details.

Quality Computers
POWER FOR PERFORMANCE

15102 Charlevoix
Grosse Pointe, MI 48230 313/331-0700

To Order Call: 1-800-443-6697 FAX 313-331-0663 School P.O.'s Welcome



Live Long and Prosper

Permit us a logical prediction. With Vulcan,™ the Apple II series will continue to live long and prosper. Applied Engineering's latest triumph, Vulcan, lives!

Vulcan high-speed internal hard disks for the Apple IIGS, IIe and II+, combine high speed flexibility and ease-of-use with sheer, raw power. The result? A quantum leap forward into the Apple II future.

Stop that infernal disk swapping and file splitting and store your massive new mega-programs on Vulcan. Speed up booting and access time while you save wear and tear on your disk drives.

Flexibility.

Choose a Vulcan from 20, 40, 100—all the way to a staggering 200 MEGs. Your Vulcan can grow as your needs grow. Start with a Vulcan sized for your current needs and upgrade to a bigger size later. Use virtually any operating system: GS/OS, ProDOS 8, DOS 3.3, CPM or Pascal 1.3. Vulcan supports them all. Choose your own partitioning scheme. Sixteen partitions with four accessible simultaneously. And partitioning and backup utilities are included. Choose an available slot. 1, 2, 4, 5, 6 or 7. Even pseudo-slot to slot 7 from another slot. Vulcan understands.

Sheer, raw power.

Vulcan's built-in power supply checks in at 70 watts. That's nearly twice the capacity of competing systems. A truly heavy-duty power supply with enough punch to safely handle a motherboard full of expansion cards. To harness all that power, Vulcan contains an ultra-quiet cooling fan. For speed, Vulcan incorporates a 16-bit data bus controller, not an 8-bit like others.

Ease of use.

Vulcan lives in the space the stock, Apple power supply formerly occupied under your Apple's hood. Just pop out the old one, slip Vulcan into its place, plug in the expansion card and connect one cable.

Your Apple II is finally ready to go up against the big boys.

Order today!

To order or for more information, see your dealer or call (214) 241-6060 today, 9 am to 11 pm, 7 days. Or send check or money order to Applied Engineering. MasterCard, VISA and C.O.D. welcome. Texas residents add 7% sales tax. Add $10 outside U.S.A.

Vulcan 20 MEG $649
Vulcan 40 MEG $849
Vulcan 60-200 MEG . . . . . CALL

APPLIED ENGINEERING®

The Apple enhancement experts.

A Division of AE Research Corporation.

(214) 241-6060

P.O. Box 5100, Carrollton, TX 75011

Prices subject to change without notice